STUDIES

IN

THE INDO-EUROPEAN SYSTEM OF NUMERALS

BY

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HEIDELBERG 1960

CARL WINTER · UNIVERSITÄTSVERLAG

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Archiv-Nr. 3174.

Satz und Druck: Rheingold-Druckerei, Mainz

ALMÆ MATRI BUDAPESTINENSI

QUONDAM DE PETRO PAZMANY
NUNC DE ROLANDO EÖTVÖS
NOMINATAE

GRATO ANIMO
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AUCTOR

PREFACE

Are there any problems left in Indo-European grammar? Is there, in particular, any room for further discussion of the numerals? And if so, is there any hope that its results will be conclusive. The sceptical, but benevolent and persevering, reader will see the author's answer to these questions before he gets half-way through the book. But it may be as well to state at once that many of the basic problems concerning the Indo-European system of numerals have never been seen, the relevant questions have never been asked; no wonder that a solution has never been attempted.

My own interest in the numerals was awakened by the peculiarities which give a distinct character to the decad-formations of the Indo-European languages. But having (as I believe) perceived the truth in this point, I was at once drawn on to other problems: to the question of the formation of the ordinals, and the so-called abstracts which proliferate in our handbooks. However surprising it may seem, the real problems in these two fields have never been noticed. Yet, once the right questions are asked, the whole development of the ordinal formations becomes transparently simple, just as the "abstracts", "particularly well illustrated" by the Slavic terms for the cardinals 5—9, suddenly transform themselves before the enquirer's eye. But for most readers the real problem will be the decads and the great variety of types, apparently irreducible to a common principle, found in the various Indo-European languages. Here again, once the crucial point, the nature of the juncture between the two constituent members, is realized, the whole problem assumes a rational complexion — the system is clearly revealed.

System is indeed a key-word in this study. In retrospect, it can be seen that previous researchers, although dealing with the most minutely systematized and most closely integrated area of the Indo-European language, in fact the most noteworthy sub-system of the linguistic system as a whole, have yet found it possible to accept without question the most ill-assorted conglomerate of data, which made no sense whatever. It is hoped that the simplicity of the pattern emerging from this study will impress the reader no less than it impressed the present writer; certainly, if the conclusions reached here are true, the basic features of the Indo-European system of numerals stand out with a clarity unwonted in any other

part of Indo-European grammar. Moreover, and this is a point of equal importance, it is here, if anywhere, that we can attain full insight into the working of the speaker's mind, the associations that prompt his reactions; once observed, the inherent dynamics of this field forces us to replace the static system of earlier scholars by a succession of chronological levels with well-marked innovations. In a word, the ready-made system of yesterday transmutes itself into a network of interactions, into incessant movement. The unending waves of innovations would have become even clearer had the writer had the space and capacity for pursuing the transformations further down the time-scale in such groups as the Romance languages, or Indo-Aryan.

The results of the individual chapters seemed to emerge with sufficient clarity to make a final chapter of summary unnecessary. Instead, it seemed more rewarding to compare the basic features worked out for the Indo-European system with those of the adjacent major linguistic groups. Unexpectedly, but no less encouragingly, the principles seen in operation in the Indo-European system have thrown light on some hitherto obscure problems of the Finno-Ugrian languages, especially of Hungarian; more important, the alleged sextal system of this group gives way to an ordinary decimal system — not borrowed from superior neighbours but built up from internal resources. The vexed problem of Indoeuropean-Semitic relations is also illuminated from this angle.

Many problems reappear in different contexts and must therefore be discussed more than once. Cross-references in the footnotes, together with an index which, though not complete, is fairly detailed, will, I hope, make it easy to find further discussion of topics which the reader wishes to follow. There is some inconsistency in the spelling (e. g.-kont-/-komt-) : I trust that it will not be disturbing.

The present study was completed in September 1958. It embodies the results of research carried out in the two previous long vacations, the only time when concentrated and continued work is possible in our universities. Thanks to the good offices of Professor Manfred Mayrhofer of Würzburg, for which it is a great pleasure to express my deep gratitude, Messrs. Winter's were ready to accept the book into their well-known series, the Indogermanische Bibliothek. Negotiations for financial support account for the long interval between that date and the time of writing this preface. But I must gratefully add that once work was started — in February this year — the publishers finished the printing in almost record time. They also generously allowed the author to add, at least in the footnotes, references to work published since the manuscript was completed. In view of

the complexities of a highly technical text, written in a foreign language, the compositors deserve the highest praise for their skilful execution of an extremely difficult task.

Last, but certainly not least, my sincere and warm thanks are due to those who have given me valuable help in preparing this book. Chapters I—V were read and criticized by my former pupil, Dr. Kathleen Forbes. They were also read by Prof. M. Mayrhofer, who contributed additional references, indicated by (M) in the footnotes, and by my colleague Mr. M. O'C. Walshe of Bedford College, whose suggestion on a Germanic problem is gratefully quoted. Finally, Prof. D. M. Jones has obliged both the reader and the author by subjecting the proofs of the whole text to the careful scrutiny of an eye which discovered misprints where the author could see none. To all these scholars I express my heartfelt gratitude. Needless to say that the responsibility for the mistakes and misprints that still remain is entirely mine.

London, 7. 9. 1960

Oswald Szemerényi

LIST OF ABBREVIATIONS

I. Periodicals

AGI	= Archivio Glottologico Italiano. Torino.
AJPh	= American Journal of Philology. Baltimore.
ANF	= Arkiv för nordisk filologi. Lund.
Arch Ling	= Archivum Linguisticum. Glasgow.
ARW	= Archiv für Religionswissenschaft. Freiburg i. Br.
ASPh	= Archiv für slavische Philologie. Berlin.
BB	= (Bezzenberger's) Beiträge zur Kunde der indogermanischen Sprachen. Göttingen.
BBCS	= Bulletin of the Board of Celtic Studies. Cardiff.
BPhW	= Berliner Philologische Wochenschrift.
BSL	= Bulletin de la Société de Linguistique de Paris.
BSO(A)S	= Bulletin of the School of Oriental (and African) Studies. London.
BzN	= Beiträge zur Namenforschung. Heidelberg.
CP	= Classical Philology. Chicago.
CRAI	= Comptes Rendus de l'Académie des Inscriptions. Paris.
IF(A)	= Indogermanische Forschungen. (Anzeiger). Berlin.
IJb.	= Indogermanisches Jahrbuch. Berlin.
JA	= Journal asiatique. Paris.
JAOS	= Journal of the American Oriental Society. New Haven, Conn.
JEGP	= Journal of English and Germanic Philology. Urbana, Ill.
JNES	= Journal of Near Eastern Studies. Chicago.
JRS	= Journal of Roman Studies. London.
KZ	= Zeitschrift für vergleichende Sprachforschung. Göttingen.
LUÅ	= Lunds universitets årsskrift.
MSL	= Mémoires de la Société de Linguistique de Paris.
Mus. Helv.	= Museum Helveticum. Basel.
NTS	= Norsk Tidsskrift for Sprogvidenskap. Oslo.
PBB	= Beiträge zur Geschichte der deutschen Sprache und Literatur, herausgegeben von Paul und Braune. Halle (Tübingen).
RAL	= Rendiconti della Reale Accademia dei Lincei. Roma.
RC	= Revue celtique. Paris.
RE	= Pauly's Real-Encyclopädie der klassischen Altertumswissenschaft, neu herausgegeben von G. Wissowa und W. Kroll. Stuttgart.
REA	= Revue des études anciennes. Bordeaux.
REL	= Revue des études latines. Paris.
RES	= Revue des études slaves. Paris.
RFIC	= Rivista di Filologia e d'Istruzione Classica. Torino.
RHA	= Revue hittite et asianique. Paris.

RhM	=	Rheinisches Museum. Frankfurt.
RPh	=	Revue de Philologie. Paris.
Sächs. Ber(ichte)	=	Berichte über die Verhandlungen der (Königlichen) Sächsischen Gesellschaft der Wissenschaften zu Leipzig.
SE	=	Studi Etruschi. Firenze.
SEG	=	Supplementum Epigraphicum Graecum. Leiden.
TPS	=	Transactions of the Philological Society. London.
Trans. Cymmr.	=	Transactions of the Honourable Society of Cymmrodorion. London.
UUÅ	=	Uppsala universitets årsskrift.
WS	=	Wörter und Sachen. Heidelberg.
WZKM	=	Wiener Zeitschrift für die Kunde des Morgenlandes.
ZCP	=	Zeitschrift für celtische Philologie. Halle (Tübingen).
ZDMG	=	Zeitschrift der deutschen morgenländischen Gesellschaft. Wiesbaden.
ZfdA	=	Zeitschrift für deutsches Altertum. Wiesbaden.
ZfPh(onetik)	=	Zeitschrift für Phonetik und allgemeine Sprachwissenschaft. Berlin.
ZSPh	=	Zeitschrift für slavische Philologie. Leipzig.

II. Books

Bartholomae, Grdr. = Vorgeschichte der iranischen Sprachen, and Awestasprache und Altpersisch, in: Grundriß der iranischen Philologie (herausgegeben von W. Geiger und E. Kuhn), I 1, 1—151, 152—248. Straßburg, 1895—1901.

Bartholomae, AiWb. = Altiranisches Wörterbuch. Straßburg, 1904.

Bartholomae, ZAiWb. = Zum AiWb.-Beiheft zum XIX. Band der „Indogermanischen Forschungen". Straßburg, 1906.

Benveniste, Origines = Origines de la formation des noms en indo-européen, Paris, 1935.

Bottiglioni, Manuale = Gino Bottiglioni, Manuale dei dialetti italici (osco, umbro e dialetti minori). Bologna, 1954.

Braune-Helm, Ahd. Gram. = Althochdeutsche Grammatik (7th ed.), 1950.

Brugmann, Die Bildung der Zehner und der Hunderter in den indogermanischen Sprachen = MU (q. v.) V, 1890, 1—61. 138—144. 268.

Brugmann, Grdr.^{2} = Grundriß der vergleichenden Grammatik der idg. Sprachen, I—II (2nd ed.), 1896—1916.

Brugmann, Gr. Gr.^{3} = Griechische Grammatik (3rd ed.), 1900.

Burrow, Sanskrit = T. Burrow, The Sanskrit Language. London, 1955.

Couvreur, Hoofdzaken = W. Couvreur, Hoofdzaken van de Tochaarse Klank- en Vormleer. Louvain, 1947.

Dittenberger, Syll.^{3} = Sylloge inscriptionum Graecarum I—IV, ed. 3., 1915—1920.

Frisk, GEW = H. Frisk, Griechisches etymologisches Wörterbuch. (In course of publication.) Heidelberg, 1954 f.

Gershevitch, GMS = A Grammar of Manichaean Sogdian. Publications of the (London) Philological Society, vol. XVI. Oxford, 1954.

Hansen, BST = O. Hansen, Berliner Sogdische Texte II. Akademie der Wissenschaften und der Literatur in Mainz — Abhandlungen der geistes- und sozialwissenschaftlichen Klasse, Jahrgang 1954, Nr. 15.

Hirt, IG = H. Hirt, Indogermanische Grammatik, I—VII. Heidelberg, 1921—1937.

Hirt, UG = Handbuch des Urgermanischen, I—III. Heidelberg, 1931—1934.

IBoT = Istanbul Arkeoloji müzelerinde bulunan Bogazköy tabletlerinden seeme metinler. (Istanbul Boghazköy Tablets I.) Istanbul, 1944.

Jackson = K. H. Jackson, Language and History in Early Britain. Edinburgh, 1953.

Kent, Forms = R. G. Kent, The Forms of Latin. Baltimore, 1946.

Kent, Sounds = The Sounds of Latin. Baltimore, 1932 (1945^3).

Kieckers, Hb. = Handbuch der vergleichenden gotischen Grammatik. München, 1928 (1960^2).

Kluge-Mitzka = F. Kluge, Etym. Wörterbuch der deutschen Sprache. 17. Auflage, bearbeitet von W. Mitzka. Berlin, 1957.

Krause, Hb. = Handbuch des Gotischen. München, 1953.

Kronasser, Handbuch = Vergleichende Laut- und Formenlehre des Hethitischen. Heidelberg, 1956.

Kuryłowicz, Apophonie = L'apophonie dans les langues indo-européennes. Wrocław, 1956.

Kuryłowicz, Études = Études indo-européennes I. Kraków, 1935.

Lehmann, PIE = Proto-Indoeuropean Phonology. Austin (Texas, USA), 1952.

Leumann-Hofmann = M. Leumann-J. B. Hofmann, Lateinische Grammatik. München, 1926—1928.

Lewis-Pedersen = A Concise Comparative Celtic Grammar by H. Lewis and H. Pedersen. Göttingen, 1937.

LH = Leumann-Hofmann.

Meillet, Caractères^3 = Caractères généraux des langues germaniques. Paris, 1926^3.

Meillet, Esq(uisse) = Esquisse d'une grammaire comparée de l'arménien classique. Wien, 1936^2.

Meillet, Introduction = Introduction á l'étude comparative des langues indo-européennes. Paris, 1937^8.

Meillet-Vendryès, Traité = Traité de grammaire comparée des langues classiques. Paris, 1953^2.

Morgenstierne, EVP = An etymological vocabulary of Pashto, Oslo, 1927.

Morgenstierne, IIFL = Indo-Iranian Frontier Languages. I 1929; II 1938; III 2, 1944; III 3, 1956.

MU = Morphologische Untersuchungen, see s. Brugmann, Osthoff.

Osthoff-Brugmann, MU = Morphologische Untersuchungen auf dem Gebiete der indogermanischen Sprachen, von H. Osthoff und K. Brugmann, I—VI. Leipzig, 1878—1910.

Pedersen, VKG = Vergleichende Grammatik der keltischen Sprachen I—II. Göttingen, 1909—1913.

Pedersen, Toch(arisch) = Tocharisch — vom Gesichtspunkt der indoeuropäischen Sprachvergleichung. Copenhagen, 1941; reprint 1949.

Pedersen, Zur toch. Sprachgesch. = Zur tocharischen Sprachgeschichte. Copenhagen, 1944.

Pisani, Gr. Lat. stor. comp. = Grammatica latina storica e comparativa. Torino, 1948.

Pisani, Le lingue (dell'Italia) = Le lingue dell'Italia antica oltre il Latino — Manuale storico della lingua latina, vol. IV. Torino, 1952.

Pokorny, IEW = Indogermanisches etymologisches Wörterbuch I (Lief. 1—13). Bern, 1948—1959.

Porzig, Gliederung = Die Gliederung des indogermanischen Sprachgebiets. Heidelberg, 1954.

Prokosch, CGG = A comparative Germanic Grammar. Philadelphia, 1939.

Rosenfeld, Zahlen = Die germanischen Zahlen von 70—90 und die Entwicklung des Aufbaus der germanischen Zahlwörter. (See here p. 148.)

Saussure, Mémoire = Mémoire sur le système primitif des voyelles dans les langues indo-européennes. Leipsick, 1879.

Schatz, Ahd. Gram. = Althochdeutsche Grammatik. Göttingen, 1927.

Schleicher, Compendium = Compendium der vergleichenden Grammatik der indogermanischen Sprachen. Weimar, 1871 (3rd ed.).

Schmidt, Pluralb. = Die Pluralbildungen der indogermanischen Neutra. Weimar, 1889.

Schmidt, Urh. = Die Urheimat der Indogermanen und das europäische Zahlsystem. Berlin, 1891.

Schulze, KSchr. = Kleine Schriften. Göttingen, 1934.

Schulze, ZGLE = Zur Geschichte lateinischer Eigennamen. Berlin, 1904.

Schwyzer, GG = Griechische Grammatik I—III. München, 1939—1953.

Schwyzer, Delectus = Delectus inscriptionum Graecarum, ed. 3—a. Leipzig, 1923.

Sieg-Siegling-Schulze = Tocharische Grammatik, bearbeitet in Gemeinschaft mit W. Schulze von E. Sieg und W. Siegling. Göttingen, 1931.

Sommer, Zw. = Zum Zahlwort (see here p. 2 fn 3.).

Specht, Ursprung = Der Ursprung der indogermanischen Deklination. Göttingen, 1944.

SSS = Sieg-Siegling-Schulze (q. v.).

Streitberg, UG = Urgermanische Grammatik. Heidelberg, 1896. (Reprint 1943.)

Thurneysen, GOI = A Grammar of Old Irish by R. Thurneysen — Revised and enlarged edition. Dublin, 1946.

Vasmer, REW = Russisches etymologisches Wörterbuch, I—III. Heidelberg, 1953—1958.

Wackernagel (-Debrunner), AiGr. = Altindische Grammatik. I, 1896; Nachträge, 1957; II 1, 1905; Nachträge, 1957; II 2, 1954; III, 1931.

WH = Walde-Hofmann, Lateinisches etymologisches Wörterbuch, 3rd ed. Heidelberg, 1930—1954.

Windekens, Morph. = Morphologie comparée du Tokharien. Louvain, 1944.

F. Wolff, Avesta = Avesta die heiligen Bücher der Parsen, übersetzt auf der Grundlage von Chr. Bartholomae's Altiranischem Wörterbuch. Straßburg, 1910 (2nd ed. 1924.).

WP = Walde-Pokorny, Vergleichendes Wörterbuch der indogermanischen Sprachen, I—III. Berlin, 1927—1932.

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INTRODUCTION

The formation of the decads in Indo-European

The Indo-European numerical system had reached a remarkably high degree of development by the time the first groups began to break away from the main linguistic block. The number "100" is attested in all dialects — except Armenian and Albanian — and can safely be traced to the form **kṃtóm*. The next higher unit in the decimal system, "1000", appears in forms based on an IE **gheslo-* in Aryan and Greek, probably also in Latin[1], and this fact would suggest that in the Southern part of the IE area, at any rate, even this number was well established. But we must also acknowledge that this number is expressed by different words in the other dialects — especially in Germanic and Balto-Slavic — and, although it is not impossible that **gheslo-* was lost in these areas, it is perhaps safer to admit that the word for "1000" was not fully established in the last period of the IE community. Even so, the agreement in the formation of the hundreds is so close that their development must be ascribed to Indo-European.

Such an early date is even more certain for the lower numerals. For the digits this is generally admitted. But in the decads we find divergences in the various dialects and several scholars have doubted whether "60 — 90" were fully developed in Indo-European. Meillet in particular strongly urged that "50" was the last common-IE decad and his view has been accepted by others[2]. Their case rests on the fact that the correspondence of Skt. *pañcāśat* ~ Gk. πεντήκοντα ~ Lat. *quinquāgintā* is the last member in the series of decads impressive enough to warrant the assumption that they continue a ready-made IE formation, while the following decads show such a degree of variation — e. g. Gk. ἑξήκοντα, Lat. *sexāgintā* on the one hand, Skt. *ṣaṣṭi*, MIr. *sesca*, Goth. *saihs tigjus* on the other — as to make it unlikely that there was an earlier common-IE prototype superseded by them. But the scholars who adopt this line of argument lose sight of two

[1] Szemerényi, Archivum Linguisticum 6, 1954, 38 f.

[2] RES 5, 1925, 181; cf. Wackernagel-Debrunner, AiGr. III 370; Schwyzer I 592 fn. 1; Pokorny, IEW 190. This was perhaps first suggested by Thurneysen, KZ 26, 1883, 311. Against it: Rosenfeld, Zahlen 180 A(but see also 211 B).

facts. First, it is undeniable that even inherited decad-formations have been replaced by more modern expressions in several IE languages. Thus no one would dare to infer from the fact that the Germanic or Balto-Slavic languages express "20" by a juxtaposition "two tens" that these languages did not inherit a word corresponding to Lat. *uīgintī*. Secondly, the fact that Indo-European already had the number "100" — based on the mathematically well-defined expression "ten tens", and not on a vague notion of "indefinite large amount" — makes it quite clear that there must have been corresponding expressions for "60 — 90". Sommer is therefore right in refusing to accept this "defectiveness" of the IE system of decads[3].

The decads "20—50" present very few difficulties and their reconstructed forms are generally agreed, even though the interpretation is far from being unanimous, as we shall see further on. But the same cannot be said of "60 — 90". In fact, even those who assume their existence in Indo-European, are rather uncertain about their actual form. The difficulties begin with "60" but assume serious proportions only with "70". From this decad on to "90" we find the well-known type represented by Gk. ἑβδομήκοντα ὀγδοήκοντα ἐνενήκοντα, Lat. *septuāgintā (octōgintā) nōnāgintā*. At first sight, it would seem that with "70" we have a break in the system. While the preceding decads clearly represent the combination of the digits in their cardinal form with a word **kont-* (cf. **trīkont-*, **penkʷēkont-* and ἑξ-ή-κοντα, *sexāgintā*), ἑβδομήκοντα ὀγδοήκοντα seem to correspond, not to the cardinals ἑπτά ὀκτώ, but to the ordinals ἕβδομος ὄγδοος; the same applies to *nōnāgintā*, and, less clearly, to ἐνενήκοντα. It looks then as if from "70" onwards the principle of forming the decads had suddenly changed: from counting, in what would seem the normal way, "two-three-four-five-six tens", the IE speakers abruptly veered to "seventh-eigth-ninth decad".

This surprising change-over from one system of counting to a completely different one is still widely accepted as a fact, and important conclusions as to the influence of a sexagesimal system still continue to be drawn from it[4]. Yet, in his important work on Indo-European numerals,

[3] F. Sommer, Zum Zahlwort (SBBayrAk 1950/7), 1951, 81. (Henceforth: Zw.).

[4] See, e. g., Schwyzer I 592[4] and, more recently, Devoto who in an interesting paper on "Correnti linguistiche e culturali anti-indoeuropee" (AGI 39, 1954, 102 – 111, now reprinted without any alterations in his Scritti Minori, 1958, 73) unquestioningly operates (p. 106) with a Babylonian influence, apparently unaware of Sommer's work. Cf. also E. Hofmann, Sprachsystem und Sprachpräzision, 1954, 17 (M); W. Krause, Handbuch des Gotischen, 1953, 175.

Sommer has shown that this interpretation is false[5]. He has demonstrated that the first members ἑβδομ- ὀγδοϝ- in "70 — 80" are not the ordinals but regular variants of the cardinals **septm̥* and **oktō*, and the same is true of ἐνενήκοντα — *nōnāgintā*. We must be grateful to Sommer for his cogent demonstration of this truth, although it is saddening to note that here again the truth had to be re-discovered. As far back as 1890, Brugmann, in his excellent study "Die Bildung der Zehner und der Hunderter in den idg. Sprachen"[6], clearly stated that ἑβδομήκοντα was based on a pre-Greek **septm̥-konta* which was refashioned to ἑβδομ-ή-κοντα (p. 38), while ἐνενήκοντα represented ἐνϝεν-ή-κοντα (p. 45)[7]. This view was still maintained in the 3rd edition of the Griechische Grammatik (1900, p. 215) but, unfortunately, no longer upheld in the relevant section of the Grundriss (II² 2, 1911, 35). The truth was also perceived by Silvio Pieri[8] and, for the Latin decads "70 — 90", at any rate, admitted by Jacobsohn[9]. It was emphatically restated by Pisani[10] and, apparently independently, by Kent[11]. We must fervently hope that Sommer's convincing demonstration will now be generally accepted[12].

But the precise form and nature of the IE formations still remains obscure at many points. To mention just a few problems, why is it that we find a juncture-vowel in "60—90" in Greek and Latin, and why is this vowel *ē* in Greek but *ā* in Latin? Why did Germanic lose the inherited forms for "20 — 60" while it continued to use them for "70 — 90"? Why does Aryan present an apparently quite different formation for "60 — 90"? And, to turn to the second part of these numerals, why do we find the divergent forms *-kn̥t/-kont* but also *-kontə* (and *-kn̥tə*?)?

[5] Zw. *passim*.

[6] H. Osthoff-K. Brugmann, Morphologische Untersuchungen V, 1890, 1 – 61. 138 – 144. 268.

[7] Sommer could not consult this important work, see Zw. 44.

[8] Rivista di Fil. e d'Istruzione Class. 35, 1907, 313.

[9] KZ 54, 1927, 89 f.

[10] Rendiconti Accademia Lincei (RAL) 6/8, 1932, 150 f.; reprinted in Saggi di Lingua e Filologia, 1934, 37 – 55.

[11] R. G. Kent, The Forms of Latin, 1946, 79.

[12] The auguries are not very favourable. As will be seen later on, many scholars who have discussed these problems in recent years, are unaware of Sommer's work and, so far as I know, none of the major periodicals has ever reviewed it. (See however Ricerche Linguistiche 2, 1952, 227; Paideia 7, 1952, 409; Živa Antika 2, 1952, 320 – 22; Lingua 4, 1954, 103 – 107). I am personally greatly obliged to Prof. Sommer for his kindness in sending me a copy of his excellent work.

The aim of the present work is to give an answer to these questions and some others connected with them. We shall therefore first examine the decads in Greek, Latin, Celtic and Armenian (Ch. I), in Germanic (Ch. II), and finally in Tokharian, Aryan and Balto-Slavic (Ch. III). The examination of the second part entails an investigation of the ordinals "3rd — 10th" (Ch. IV), which will enable us to interpret this element itself and the nature of the formation as a whole (Ch. V).

CHAPTER I

The decads in Greek, Latin, Celtic and Armenian

60 Gk. ἑξήκοντα (Argive, Laconian Ϝεξήκοντα), Lat. *sexāgintā*, Arm. *vat'sun*, MIr. *sesca*.

The Aryan, Balto-Slav and Germanic formations are so different, both in their relation to each other and to the other languages, that they cannot be utilized for the reconstruction of the IE type. But the agreement of Greek, Latin, Celtic and Armenian is sufficient to establish the IE character of the formation represented by them. To their evidence we shall have to add that of Tokharian which is also unequivocal on this point (Ch. III). But the evidence of these four (or five) languages, although in overall agreement, is not quite unanimous on the question of the juncture-vowel.

Greek points to IE **sweks-ē-kont-*, Latin to **s(w)eks-ā-kont-* (or *-kn̥t-* ?), while for MIr. and Arm. it is sufficient to start from **sweks-kont-*. Sommer thinks, as did others before him, that *ē* in the juncture of the Greek form, taken over from **penk^{w}-ēkont-*, is "voreinzelsprachlich"[1]. In that case we would be forced to assume that Lat. *sexāgintā* is remodelled after *quinquāgintā* — this in turn after *quadrāgintā* — while MIr. *sesca* is to be traced, not to **sweks-kont-s*, as is done by Brugmann, Pedersen, Thurneysen and Lewis[2], but to "**sweks-u-kont-*, urir. **sessu-kant-*[3], mit dem gleichen *-u-*, das auch bei 70 — 90 als Fugenvokal an die Stelle von gr. *-η-* (lat. *-ā-*) tritt"[4]. But if *-ē-* had existed in Pre-Latin both in **quinquēgintā* and in **sexēgintā*, it is hardly credible that their combined force, together with the support from **septum-ē-gintā*, **noun-ē-gintā*, should have been insufficient to resist the pressure from the single word *quadrāgintā*. Similarly, the assumption of a basic form **sessukont-* is without foundation since, as we shall see presently, the alleged prototypes for *-u-* never existed. Thus there is no evidence for an IE **sweks-ē-kont-* and it is more satisfactory to assume that both Irish and Armenian continue the inherited

[1] Zw. 23[3], 81, 82, 86.

[2] Brugmann, MU 5, 35; Grdr.[2] II 2, 34; Pedersen, VKG II 130; Thurneysen, Grammar of Old Irish (GOI), 1946, 509; Lewis-Pedersen, 189.

[3] Sommer's *-kant-* ist a mistake for *-kont-*.

[4] Sommer, Zw. 23 fn. 3.

**sweks-kont-*, while Greek and Latin remodelled the inherited word because both *ἑσκοντα and **sescintā* would have been at variance with the rest of the series.

70 Gk. ἑβδομήκοντα (Delph. Heracl. ηεβδεμήκοντα), Lat. *septuāgintā*, OIr. *sechtmogo*, Arm. *evt'anasun*.

After Sommer's cogent demonstration it can be regarded as established that the type reflected by the Latin and Greek forms does not represent a "break" in the system but is based on the same principle as the preceding decads. Accordingly, the meaning is "seven tens", not "seventh decad". The formal analysis is, however, still unsatisfactory.

In order to account for the voicing of the original cluster *-pt-* in ἑβδομήκοντα, ἕβδομος and a few other words, Sommer assumes that in "compounds and derivatives, before a following vowel, the cardinal must at one time have had the forms **septm-* and **septm̥m-*"[5]. The latter variant, he believes, must be rejected for Greek, since ἕβδομος, on account of its agreement with OSl. *sedmъ*, shows that the voicing is very old[6] and this presupposes that at one time *-pt-* was immediately followed by *-m-*; the vowel *-o- (-ε-)*, appearing in the historical Greek forms, is a Greek innovation. In other words, both "70" and "7th" presuppose an IE **septm-V-* in which *-ptm-* was voiced to *-bdm-*.

But here the question arises whether such a cluster was possible at all in IE times. Sommer is well aware of the difficulty: "in the agreement between *ἕβδμος and *sedmъ* Siever's law is inoperative"[7]. In the light of Edgerton's results, however, we clearly need more than a mere statement of deviation to make this unusual construct acceptable[8]. A sequence *-eptm-o-* is from the IE point of view impossible, it could only be articulated as *-eptm̥mo-*.

Now the main force of the argument that *-ptm-* existed in Indo-European and was voiced to *-bdm-* lies in the apparent identity of ἕβδομος and *sedmъ*. Yet, this oft repeated equation is anything but cogent, especially from the Slavic point of view. For indeed what would have been the deve-

[5] Zw. 17.

[6] See also Meillet, BSL 29, 1928, 30; Meillet-Vaillant, Slave Commun, 1934², 129. 141; Vaillant, Gram. comp. des langues slaves I, 1950, 91; Frisk, GEW 435.

[7] Zw. 17 fn. 1

[8] See Edgerton, Language 19, 1943, 86 § 8b; Lehmann, Proto-Indoeuropean Phonology (PIE), 1952, 10f.: type *ktiya*. Endzelin also thinks (KZ 65, 1938, 137) that *sebdmos*, because of **oktmos*, is unlikely.

lopment of IE **septm̥* and **septm̥mo-* ? We know that inherited *-pt-* was reduced to *-t-*, a development best shown by the clear case of OCS *netiji* "nephew", reflecting IE **neptiyo-*[9]. It is thus obvious that **septm̥* gave **setъ* and **septm̥o-* led, in the first place, to **setmo-*. But, in the latter, *-tm-* — emerging after an original sequence *-tm-* was apparently reduced to *-m-*[10] — was voiced do *-dm-*, hence *sedmь*, which then transformed the inherited **setъ* into *sedmь*[11]. In view of this clear and simple development there is no justification for positing a structurally impossible IE **septmo-*, and thus -βδ- in the Greek forms cannot be accepted as reflecting an IE voicing.

It is, on the other hand, just as clear that the voicing must have arisen in some such way as described by Sommer in the course of the formation of Greek, between Indo-European and the historical period. Once this is admitted, it is fairly easy to discover the stage at which the voicing must have occurred by examining the formation of the numeral. Sommer interprets ἑβδομήκοντα as representing *ἑβδμ-ή-κοντα, with the juncture-vowel *-ē-* introduced, through "60", from "50" already in IE times[12]. At the same time, he assumes that *septuāgintā* reflects a corresponding **septm-ā-gintā* or **septm̥m-ā-gintā*, both of which would have developed into **septumāgintā*; the historical form arose by dissimilation of the nasals *m-n* to *w-n*[13], as was first suggested by Bugge[14], and does not presuppose an unlikely and unattested prehistoric **octuāgintā* as is usually assumed[15].

[9] See Meillet-Vaillant, Slave Commun, 1934², 127 f.; Vaillant, Gram. comp. des langues slaves I, 1950, 81 f. I do not believe in an "earlier" development into *st*, suggested by Vey, BSL 32, 1931, 65 – 67 (now repeated in Voprosy Jazykoznanija 1958/3, 96 f.), and accepted by these authors, but I cannot go into the question here. Cf. also Vasmer, Russ. Etym. Wb. (REW) II, 1955, 215.

[10] See Vaillant, o. c. 90. There is no example of *-tm-*, see Meillet-Vaillant, o. c. 141.

[11] Vasmer, REW s. vv. derives *sedmь* from **setъ* < **septm̥*, but *sedmь* from **sebdm-*. I would point out here that the voicing of *-tm-* to *-dm-* is paralleled by that of *-tl-* to *-dl-*, see Szemerényi, Kratylos 2, 1957, 120 f. On *sedmь* see Ch. IV, p. 109 f. For the development of *-tm̥mo-* to *-tmo-*, see Brosman, Language 33, 1957, 14.

[12] Zw. 23, esp. fn. 3.

[13] Zw. 37, also considered most likely by Rosenfeld, Zahlen 183 A.

[14] Bugge, BB 14, 1889, 71; J. Schmidt, Die Urheimat der Indogermanen und das europäische Zahlsystem (Urh.), AbhAkadBerlin, 1890/2, 1891, 41. Schulze, KZ 42, 1909, 380 (= KSchr. 58) assumed dissimilatory loss of the nasal; slightly differently S. Pieri, RFIC 35, 1907, 312: *septu̯hā-* like *circu̯heo*; Jacobsohn, KZ 54, 1927, 89 f. hesitates between Schulze's and Pieri's view.

[15] Wackernagel, KZ 25, 1881, 281 (= K. Schr. I 225); Vermischte Beiträge zur griech. Sprachkunde, 1897, 47 (= K. Schr. I 808); Brugmann, MU 5, 37; Meillet-Vendryès, Traité de gram. comp. des langues classiques, 1953², 515; Leumann-Hofmann, Lat. Gram., 1926 – 28, 293; Walde-Hofmann, Lat. Etm. Wb. (WH)

Here again Sommer is right in his explanation of *-uā-* in *septuāgintā* but his analysis **sept(m̥)m-āgintā* presupposes the influence of *sexāgintā*[16], which is difficult to admit. For, as we have emphasized before, if the inherited form of "60" was **sweks-kont-*, or, as Sommer supposes, **weks-ē-kont-*, and that of "50" **penkʷēkont-*, it is hard to see how the single decad "40" should have been able to impose its vowel-timbre — unless it received some support from elsewhere. The source of this support becomes clear if we attempt to reconstruct the IE form of the numeral "70".

To assume IE **septm̥-kont-*, as was done by Brugmann[17], will not do for the Greek form whose -βδ- will be left without explanation. The only way in which we can explain this mysterious voicing is by positing, in accord with IE **kʷetwr̥-kont- *penkʷēkont-*, a form **septm̄-kont-*. This first led to Proto-Greek *ἑπτμᾱ-κοντ- and Proto-Latin **septmā-kont-*. In Proto-Greek, the fact that πτ was now immediately followed by the voiced nasal led to the voicing of the whole group, resulting in *ἑβδμᾱ-κοντ-, while in Latin **septmā-kont-* was resolved into **septamākont-* and eventually weakened to **septumāgint-* etc., always preserving *-pt-*, probably under the pressure of *septem septimus*, and, possibly, of *octō(gintā)*[18].

The appearance of -βδ- in "70" had further repercussions in Greek. The primitive *ἑπταμος, developed from **septm̥mos*, showed at this stage, when **septm̥* had already proceeded to ἑπτά, a unique relation to the basic word — there was no other ordinal formed with -μο- — and being thus closer to *ἑβδμᾱκοντ- *ἑβδμᾱκονστός changed to *ἑβδαμος. Its α was then modified, under the influence of *ὄκτοϝος[19], to *o*: ἕβδομος[20], entailing a similar

II 200; Pisani, Grammatica Latina storica e comparativa, 1948, 205 (very complicated); RAL 6/8, 150 f. F. Skutsch (Forschungen zur lat. Grammatik und Metrik I, 1892, 23 f.) is correct.

[16] Ciardi-Dupré, Giorn. Soc. As. Ital. 17, 1904, 337, assumed (as Kent did recently, Forms 79) that *septuāgintā* owed its *-uā-* to *quinq-uā-gintā*, which is rightly rejected by Sommer (Zw. 38 fn. 1) since it is purely mechanical and does not explain how "50" should have influenced "70" when "60" is not **sexuāgintā*.

[17] MU 5, 37 f.

[18] Rosenfeld (Zahlen 183 B) says: "Dass *septuā-(gintā)* nur als Ordinale . . . in Frage kommt, ist gesichert, solange nicht mit einem zum zweiten (!) Bestandteil gehörigen Bildungsvokal zu rechnen ist, der den Auslaut des Kardinale beeinflussen konnte. Aber letzteres anzunehmen, liegt nicht der mindeste Grund vor". But what if the "Bildungsvokal", or rather "Bindungsvokal", belongs to the first part?

[19] For this see also our discussion of "80" and of the ordinals in Ch. IV.

[20] There is no foundation for Brugmann's **septom-* (MU 5, 38; Gr. Gr.[3] 215; Grdr.[2] II 2, 35, accepted by Pisani, RAL 6/8, 152) in Indo-European although it is not impossible for pre-IE.

change in *ἑβδμᾱκοντ-, while *ὄκτοϝος itself took over the voicing, changing to ὄγδοϝος, as did *ὀκτοϝᾱκοντα under the joint influence of ὄγδοϝος and ἑβδομᾱκοντα[21].

We now begin to see why Latin generalized the uniform juncture-vowel -ā- in its decads. It is already clear that in the inherited set of decads, i. e. **wīk- *trīk- *quadrāk- *quinquēk- *sesk- *septamāk-*, from "40" onwards the -ē- of "50" was outnumbered by the -ā- of "40" and "70", to which, as we shall see, we have to add *nōnāgintā*; in the "battle" for "60" the -ā- of "40", "70" and "90" carried the day and in the end "50" itself succumbed to the combined pressure of "40", "60", "70" and "90". More precisely, "60" acquired its -ā- from "70" and then "50" was brought into line with "40" and "60 — 70" (— "90").

In Greek the position was rather different. To begin with, it is not quite certain whether "40" developed into *τετράκοντα or into *τετρώκοντα[22]. On the other side of πεντήκοντα, the new forms of "70 — 90" were so far removed from the digits — compare *ἑβδομᾰ́κοντα — ἑπτά, *ὀγδοϝᾰ́κοντα — ὀκτώ, *ἐνϝ(α)νᾰ́κοντα[23] — ἐν(ν)έϝα — that the inherited *ϝέσκοντα could not be influenced by them, while the clear relation between πέντε: πεντήκοντα prompted the equally transparent innovation *ϝεξ-ή-κοντα. This hard core of decads, with its characteristic -ē-, then began to exert its influence, aided by the circumstance that, on its other side, "40" had -ᾰ̄- or -ω- in historical times, not -ᾱ-, while "30" was effectively put out of action by the paralyzing deviation of "40". In Attic-Ionic, of course, one could assume that -η- in "70 — 90" is regularly developed from -ᾱ-, but in the other dialects it is more likely that we have to do with an internal expansion from "50 — 60" rather than with an influence from Attic-Ionic[24]. At present, it is impossible to decide, even for Attic-Ionic, whether the forms with -ᾱ- survived long enough to take part in the dialectal change of ᾱ to η which probably occurred after 1,000 B. C.[25]; the decision can only come from the Mycenaean texts which have already revealed some interesting numerals but have produced no decad as yet.

The reconstruction of the IE form of "70" as **septm̥-kont-* is also required by Celtic, i. e. OIr. *sechtmogo*. This is usually traced to **sextamo-*

[21] The ε in dialectal ἑβδεμήκοντα is due to assimilation to the flanking vowels.

[22] See, however, our discussion of "40" further on.

[23] See under "90".

[24] As is assumed by Rosenfeld, Zahlen 182 B(: "besonders bei der grossen Geltung der homerischen Dichtung"!).

[25] Cf. Risch, Mus. Helv. 12, 1955, 65; Chadwick, Greece and Rome 3, 1956, 42.

kont- or **sextam-u-kont-*[26]. Sommer rightly says[27] that *sechtmogo* does not differ essentially from ἑβδομήκοντα and *septuāgintā*, that is to say, is based on the cardinal, not the ordinal; going a step further, he suggests that the IE juncture-vowel *ē (ā)* was replaced by *-u-* or, less likely, by the compositional *-o-*. As others before him, he suggests for *-u-* influence from "40", and, possibly, from "80"[28]. But it is difficult to see why the forerunner of OIr. *cethorcho* "40" should be reconstructed as **k^{w}etru-kont-*, as is generally done[29]; there is simply no evidence for such a primitive form and it would not represent the inherited IE form. The usually quoted forms, Gaulish *Petru-corii* "(people of the) four tribes", Gaul-Lat. *petrudecametus*[30] "fourteenth", prove that from the numeral "4" the form **k^{w}etru-* (the IE variant of **k^{w}etwr̥*), which was regular in compounds — cp. Lat. *quadru-pēs*, Middle Persian (Turfan) *tasbāy* "quadruped" from **čaθru-pāda*, Av. *čaθru-gaoša-* "four-eared" etc. — penetrated into "14", a case comparable with that of Skt. *catur-daśa*. But they cannot prove that IE **k^{w}etwr̥kont-* had its first member replaced by the same form. It would be more palatable to accept Sommer's alternative suggestion that **oktu-* may have an original *-u-*, not one due to *petru-*. Although his assumption of an IE nil-grade form **oktu-* is not well founded, we can point to the fact that **oktō* appears with *-ū-* in Gaul. *oxtumetos* and thus **oktōkont-* could also appear as **oxtūkont-*. We would then have a suitable basis for an analogically influenced **sextamūkont-*. But the question still remains: what was the primitive form that was changed analogically? In the light of our results the answer must be: the Celtic descendant of IE **septm̥kont-*, that is **septmākont-* and later **sextamākont-*.

This conclusion is inevitable since, on the one hand, the Lat.-Gk. formation is not based on IE *-ē-/-ā-*, and, on the other, the alternative, IE **septm̥-kont-*, would have led to an easy **sextankont-*, resulting in OIr. **sextego*, which would have survived. Moreover, for *sechtmogo* and *ochtmogo* we need one form at least where *-m-* was regularly developed from an IE antecedent — which can only be found in IE **septm̥kont-*.

[26] See Pedersen, VKG II 130; Lewis-Pedersen, Concise Comp. Celtic Grammar, 1937, 189; Thurneysen, GOI 247.

[27] Zw. 44 f.

[28] Zw. 45 fn. 1.

[29] See Pedersen, l. c.; Thurneysen, l. c., Sommer, l. c., Pokorny, IEW 643.

[30] CIL XIII 2494, cf. Loth, CRAI 1909, 23 – 25. It is unimportant in this context whether Hertz's suggestion that we should read and interpret *Petrudecametus* "Halbmonatstag" (ap. K. H. Schmidt, ZCP 26, 1957, 255 fn. 1) is correct or not.

The further development of **sext(a)mākont-* is, at first sight, not easy to determine. Its *-ā-* may have been umlauted to *ō*, as was *mār* to *mōr*, the *ō* being afterwards shortened to *o*. On the other hand, the shortening may have occurred first, followed by a colouring to *o* by the preceding labial at a later stage. Finally, we may even have to assume that if **oktō*, developing into **oxtū*, entailed a change from **oktōkont-* to **oxtūkont-* (instead of Goidelic **oxtākont-*), this might have changed **sext(a)mākont-* to **sextamūkont-* before "80" itself gave way to **oxtamūkont-*, remodelled after "70".

The last explanation seems to be supported by British where we have OW. *trimuceint* "30". It is generally held that this form was influenced by "70" and "20". The influence of the latter is clear in the ending *-ceint*, replacing the expected *-gant* (from *-kn̥t-* ?) or rather *-gunt* (from *-kont-*). The influence of "70" is invoked to explain *-m-*. But how could "70" influence "30" ? Here again we must assume that the influence radiated, through "40", from "80". In other words, "80", in the form **oxtamūkont*, changed **petrākont-* to **petramūkont-* which in turn transformed **trīkont-* into **trīmūkont-*. By the end of the 5th c. A. D. **trīmūkont-* would develop into **trīµīgont-*[31], and it is obviously around this time that **wīgantī* "20" and **trīµīgont-* began to exert mutual pressure. This resulted in **trīµīgont-* being transformed to **trīµīgantī*, the ending developing into *-ent'* in the first half of the 6th c., and later into *-eint*. Furthermore, the *-u-* of OW. *trimuceint* is probably due to *uceint* "20" — whatever the origin of *u-* in this[32] — although the colouring of *i* to *u* may have been (also ?) due to the preceding labial[33].

Arm. *evt'anasun* "70" can hardly contribute to the solution of our problem. If the original form was **septm̥m-ē-kont-*, that would have developed into **evt'amisun*, and then into **evt'amsun*, while a primitive **septm̥̄kont-*, first resulting in **evt'ansun* would have given **evt'asun* in the end. It is thus clear that the inherited form was refashioned and filled out after the digit *evt'n*[34].

[31] For the questions involved see Jackson, Language and History in Early Britain, 1953, 480 f., 543 f., 695.

[32] See Pokorny, ZCP 15, 1925, 378. Lewis-Pedersen, o. c., § 6. 3 seems less likely.

[33] See Jackson, o. c., 276. 318 ? — Pokorny, IEW s. v. 5. *ter-* interprets *trim-uceint* as "Dekade über 20 hinaus", but where is *trim* found in British ?

[34] If IE* *septm̥mākont-* were still acceptable we could start from early Arm. **evt'amasun* from which *evt' anasun* would have developed after *evt'n*. But in view of the wide-spread use of the compositional *-a-* it is obviously impossible to find support for that IE form in Armenian.

80 Gk. ὀγδοήκοντα (Heracl. hογδοήκοντα, Ion. Dor. ὀγδώκοντα), Lat. *octōgintā*, OIr. *ochtmogo*, Arm. *ut'sun*.

Our most reliable guides up to now fail to provide a single form for "80". Greek ὀγδοήκοντα strangely contrasts with Lat. *octōgintā*. We have seen that the gap had earlier been bridged by positing a pre-Latin **okto-wāgintā*. Since, however, the historical *septuāgintā* lends no support to this construct, the gap has again reappeared. Assuming that *-ē-* was already IE, Sommer explains ὀγδοήκοντα as due to anaptyxis from *ὀγδϝ-ή-κοντα, the first part being the short form of **oktōu*, with the same regular voicing as in the case of *ἑβδμ-[35]. But the syllabic structure of Indo-European excludes **oktwos* just as much as **septmos*; the only possible form would be **oktuwos* which could not account for the voicing. Moreover, the parallel of the preceding decads shows that it is unwarranted to project Gk. *-η-* into Indo-European. We are thus led to the conclusion that the Latin numeral stands nearer to the IE form and may even represent it in its first part. In any case only IE **oktō-kont-* or, perhaps, **oktou-kont-* can be accepted as the probable prototypes[36].

If then the primitive Greek form was *ὀκτώκοντα (or *ὀκτούκοντα), it is obvious that the historical ὀγδοϝήκοντα is due to the influence of ἑβδομήκοντα. Just as the interaction of *ἕβδαμος and *ὄκτοϝος led to ἕβδομος-ὄγδοϝος, so *ὀκτώκοντα succumbed to the joint pressure of *ἑβδομἄκοντα and ὄγδοϝος[37].

The Homeric form ὀγδώκοντα (B 568 = 652) is therefore no longer „ambiguous"[38]. The only prehistoric form with *-γδ-* was ὀγδοήκοντα. But as this form could not be used in the hexameter, the new Ionic form, in which *-οη-* was regularly contracted to *-ω-*, was admitted. There is nothing irregular about it, except that it is not a very early form; but the passage in which it occurs, is not early either. Contraction occurs several times in Homer; cf. βώσαντι, βωστρεῖν, and the camouflaged contraction in ἀστυβοώτης, with diektasis from *ἀστυβώτης, earlier *ἀστυ-βοήτης[39]. The Homeric form is certainly not „a refashioning" of ὀγδοήκοντα after ὀκτώ, as suggested by Schwyzer[40], for in that case we would have *ὀκτώκοντα;

[35] Zw. 24 f.

[36] For **oktou-* see Ch. IV and Appendix *5*.

[37] See "70".

[38] Zw. 25 fn. 2.

[39] See Chantraine, Grammaire homérique I, 1948², 35. 260. Schwyzer's statement that contraction of οη to ω is not proved for Homer (based on Froehde, BB 20, 1894, 196 f., cf. also Brugmann, Gr. Gr.³ 61) is untenable.

[40] Schwyzer I, 592.

we never find *ἑβδήκοντα or sim. That the Homeric form is genuine (later) Ionic, is proved by the Herodotean ὀγδώκοντα which has also been labelled „epic"; but the contraction of -οη- to -ω- is also found in Herodotus' νῶσαι ἀλλογνώσας and in Ion. βωθέω[41]. In point of fact we would have ὀγδώκοντα even in Attic (cf. μισθῶτε from μισθόητε), if the pressure of the series had not been strong enough to keep the ending distinct. Theocritus' ὀγδώκοντα (IV 36) is also genuine Doric; the contraction also shows that the original form had -η- not -ᾱ-, for -οᾱ- would have been contracted to -ᾱ- (cf. Coan, Rhod. Βᾱδρόμιος).

Celtic, as we have seen, almost certainly requires **oxtūkont-* which again is not refashioned from an earlier **oxtowēkont-*. The Armenian form is also best traced to **oktōkont-*[42]; it certainly cannot represent **oktowēkont-* or **oktowākont-*.

90 Gk. ἐνενήκοντα (Homer also ἐννήκοντα, τ 174; ἐνήκοντα from Delos, 274 B. C., and Phocis (or Oetaea), 161 B. C.[43]), Lat. *nōnāgintā*, OIr. *nōcha*, Arm. *innsun*.

The comparison of *nōnāgintā* and ἐνενήκοντα led Wackernagel[44] to trace them to **nowenāgintā* and **ἐνϝενᾱκοντα* respectively, and his results are now on the whole supported by Sommer who, with a slight modification for Greek, would start from **ἐνϝανήκοντα* where the sequence ε-α-η led to the assimilated ε-ε-η[45].

From the point of view of Indo-European there are two important questions: 1) what is **nowen-*/ἐνϝεν (ἐνϝαν-)? 2) what is *-ā-*/*-η-*? As to the first question, we may now confidently answer that it is the cardinal "9", not the ordinal "9th"[46]; the Greek form will occupy us further on. As to the juncture-vowel, Sommer assumes that Lat. *-ā-* and Greek *-η-* represent the vowel of *quinquāgintā*/πεντήκοντα, which was present already in the IE form. This assumption cannot be accepted. We have seen that

[41] Buck, Greek Dialects, 1955, 42; Schwyzer, I 249.

[42] Pisani (RAL 6/8, 156. 165) posits **ōktōkont-* but *ō-* is impossible and unnecessary. The correct solution is the commonly accepted one: **oktō* became **optō* (after '7') from which by regular development *ut'*. Georgiev's derivation of *ut'* from **ott* < **okt-* (Voprosy Jazykoznanija 1958/6, 13) does not seem possible.

[43] IG XI, 2, 199 $B_{32.33}$ and Schwyzer, Delectus 355 I 7 (for the date, Dittenberger, Sylloge[3] 647).

[44] KZ 25, 1881, 260 (= K. Schr. I 204).

[45] Zw. 35 f.

[46] Sommer, Brugmann (MU 5), Pisani, Kent.

the IE forms of "50 — 80" were **penk^{w}ēkont- *sweks-kont- *septm̥̄-kont- *oktō-kont-*, and there is no justification for an IE **newn̥n-ā-kont/*enwn̥n-ē-kont-*. On the contrary, Lat. *nōnāgintā* clearly demands IE **newm̥̄-kont-* which developed into pre-Latin **neunākont-*; this form — and not an alleged **newenākont-* — later became *nōnā-* with the same aberrant *-ō-* as in *nōnus*.

What would be the result in Greek from an IE **newm̥̄-kont-* ? The answer is complicated by the fact that IE **newn̥/newn̥nos (*neun-o-s)* underwent certain changes in Greek, largely due to the prothetic *ἐ-*. In fact, we have to accept the variants *ἐνεϝα (from **e-newn̥*) and *ἐνϝα (from **e-nwn̥* ?). If we start from the former, we would expect IE **newm̥̄kont-* to develop into *ἐνευνᾱκοντ- which can hardly be the basis of the historical forms. If, on the other hand, we assume that in "90" IE **new-* appeared as Gk. ἐνϝ-, we shall expect from IE **newm̥̄kont-* an early Greek *ἐνϝνᾱκοντ-. Now as far as the behaviour of the digamma is concerned, we could assume that it was parallel to that of the *-ϝ-* in early *τετϝράκοντα from IE **k^{w}etwm̥̄-*. Mycenaean *k^{w}etoropopi*, i. e. *k^{w}etro-popphi*, from IE **k^{w}etwm̥-pod-*, shows that the *-ϝ-* in the cluster *-τϝρ-* was lost in pre-Mycenaean times, certainly before the XIVth c. B. C. We could thus infer that an early *ἐνϝνᾱκοντ- developed in the same way into pre-Mycenaean *ἐννᾱκοντ-, or if the change in the juncture-vowel is as early, into *ἐννηκοντ-. In that case it would be tempting to regard the difficult ἐννήκοντα of Homer (τ 174) as a precious survival. But this unique form, contrasting with the normal ἐνενήκοντα, can hardly lay claim to such venerable antiquity[47]. For we cannot overlook the fact that it would be impossible to get from *ἐννήκοντα to ἐνενήκοντα/ἐνήκοντα. We must therefore return to the stage where IE **newm̥̄kont-* resulted in an early *ἐνϝᾱκοντ-.

At that stage the preceding decads were the descendants of *ἑπτμᾱκοντ- ὀκτώκοντ- which, as we have seen, had given way to *ἑβδομᾱκοντ- ὀγδοϝᾱκοντ-. The system at this time was:

ἑπτά	ἕβδομος	ἑβδομήκοντα
ὀκτώ	ὄγδοϝος	ὀγδοϝήκοντα
ἐν(ν)έϝα	*ἔνϝανος[48]	*ἐνϝνήκοντα.

In all three cases the decad is far removed from the digit, but in "70 — 80" is in close accord with the corresponding ordinal. It was therefore inevitable that the slightly aberrant "90" should fall in line with the pat-

[47] See Sommer's detailed discussion in Zw. 32 f., esp. 32[2] and 33[1].

[48] See Zw. 30 and here Ch. IV, p. 89.

tern, and the result could only be *ἐνϝανᾱκοντα (-η-). From this, by assimilation, developed ἐνϝενήκοντα, Att. (Hom. etc.) ἐνενήκοντα, and, by haplology, the late ἐνήκοντα[49].

In Armenian, the primitive **newn̥kont-* developed into **enewan-sun-* > **inū(n)sun* > **in-sun*, eventually filled out again to *inn-sun*.

Celtic also fits in very well. OIr. *nōcha* is usually traced to **newokont-*[50] or **nawu-kont-/nowu-kont-*[51], but it is impossible to reconcile either of these basic forms with the fact that Celtic started with the digit **newan* "9"[52]. If, on the other hand, we start from IE **newn̥kont-*, the expected development is **neunākont-* > **nounākont-*, from which Pre-Irish **nōnācho*, and, with haplology, *nōcha*[53] is obtained.

* * *

We must now turn our attention to the lower decads. It is generally agreed that "50" was IE **penkʷēkont-*, the "juncture-vowel" being guaranteed by the universal Greek πεντήκοντα, Aryan **pančāśat* and Arm. *yisun* from **hingisun*.

40 The next lower decad is not quite clear. To begin with, the Greek dialects show several forms: Ion. τεσσεράκοντα (Ephesus τεΤαράκοντα)[54], Att. τετταράκοντα, Boeot. πετταράκοντα are clearly regularized forms, while τετρώκοντα, found in Delphian and Doric (and probably all West Greek)[55] is, on the face of it, archaic. But it is not easy to see what lies behind this archaic form. J. Schmidt suggested that, like τετταράκοντα, τετρώκοντα contained as its first member the ntr. pl. of the digit, which, on the basis of Skt. *catvār-i*, he reconstructed as **kʷetwōr*; by metathesis, the early *τετϝωρ became τετρω-[56]. But Brugmann rightly pointed out

[49] Against Schwyzer's "expansion" of *ἐν(ϝ)ήκοντα to ἐνενήκοντα (I 591, accepted by Ward, Language 24, 1948, 51[3]), see Sommer, Zw. 35. There is no reason for assuming an *ἐνϝεμο- formed on *ἑβδεμο- (Rosenfeld, Zahlen 182 A).

[50] Pedersen, VKG II 130; Lewis-Pedersen, 189.

[51] Thurneysen, GOI 247.

[52] See Sommer's terse judgement: "beides wenig wahrscheinlich" (Zw. 44).

[53] Haplology was assumed by Pisani (RAL 6/8, 151) who, however, started from IE **newen-ā-k-*.

[54] West Ionic (Sicily) offers the 6th c. τετράϙοντα (SEG 4.64).

[55] Schwyzer I 592 states that the form is also Ionic but on this see the text further on.

[56] Pluralbildungen der idg. Neutra, 1889, 192; accepted by Kretschmer, KZ 31, 1892, 412; Schwyzer I 592; Kuryłowicz, L'apophonie en indo-européen, 1956, 85 fn. 52.

that this metathesis was impossible and the only result could have been *τετορκοντα[57]. He therefore proposed to interpret τετρω- and Lat. *quadrā-* as presenting the same relation as στρωτός and *strātus*, that is reflecting an IE *r̥̄*. The primitive form of "40" was therefore **k^{w}etwr̥̄-kont-*, showing the same long vowel at the end of the digit as **trīkont- *penk^{w}ēkont-*[58].

There can be no doubt that this is the only primitive form that satisfies Lat. *quadrāgintā*[59]. It also accounts for the aberrant *-d-*: in the cluster *-twrā-*, from IE *-twr̥̄-*, *t* followed by two voiced sounds was itself voiced[60]. But for Greek the explanation is not generally accepted because the development of IE *r̥̄* is disputed. Those who assume that the only result was ρᾱ (Hirt), must find some alternative explanation for τετρω-. Those who assume that *r̥̄*, depending on the full-grade form, gave varying results[61] (ρᾱ ρη ρω from the full-grade forms ερα/ρᾱ, ερε/ρη, ερο/ρω), are hard put to it to find an explanation since, if there ever was a second syllable, it was of an *a*-colour — being the ntr. pl. ending in that case — and the expected result would be ρᾱ. If therefore one still wants to regard τετρω- as a purely phonetic development, one must either side with Brugmann, who, after de Saussure, regarded the *o*-timbre as the only true development, or with Walde who constructed a primitive **k^{w}etw$_{o}$rəkomtə* in which *$_{o}$rə* resulted in ρω because of the assimilatory influence of the reduced *o*[62]. To say that ρω results from a "resonant plus laryngeal"[63] is of little help as long as it is not shown that the ntr. pl. ending was, or contained H_3; for τέτορες clearly does not owe its *o* to a laryngeal.

A phonetic interpretation of τετρω- is thus fraught with difficulties. But if we consider the numerical system in its interactions, a new departure will become possible. The ᾱ of τριᾰκοντα is often thought to be the ntr. pl. of τρεῖς[64]. But this is impossible since, first of all, the ntr. is attested as τρίᾰ, secondly, in IE times, *-ā* was only used in the thematic stems while the

[57] MU V 29 f.

[58] MU V 30 – 32; Grdr.^{2} II 2, 33.

[59] Kent's *quadrā-* from an Italic ntr. pl. **kwaturā* or **kwatworā* (Forms 77) would be unparalleled in the Latin decads; it also fails to account for *-d-*. Rosenfeld's "recht zweifelhaft" (Zahlen 183 A) is only due to his ordinal theory (cf. p. 184 A).

[60] Osthoff, Etymologische Parerga I, 1901, 165 (162 fn. 1) — in spite of Brugmann, Grdr.^{2} II 2, 15; WH II 395.

[61] Schwyzer, see Ruipérez, Emerita 18, 1950, 387 f., further developed by Adrados, Hommages Niedermann, 1956, 17 f.; cf. also Collinge, ArchLing 5, 1953, 85.

[62] Stand und Aufgaben der Sprachwissenschaft, 1924, 166; Pokorny, IEW 643.

[63] Lehmann, PIE 94.

[64] Meillet-Vendryès, Traité 444; Chantraine, Morphologie hist. du grec, 1947^{2}, 8.

-i-stems had *-ī* (and possibly *-iyə* ?)[65]. We simply cannot get round the fact that the IE form of "30" was **trīkont-*. Those who admit this try to account for the historical Greek form in one of two ways. Some assume that **trīkont-* was in Greek transformed to *τριᾰκοντα in the first place, with the new regular ntr. pl. form of the digit, and this, under the influence of πέντε: πεντήκοντα, to τρίᾰ: τριᾰκοντα[66]. But it is impossible to see how **trīkontə* could have been influenced by πεντήκοντα when "40" was not. It is, on the face of it, more rational to assume, as Brugmann did[67], that in the series **trīkomtə *kʷetwr̥̄komtə *penkʷēkomtə* the first member, changed to *τριᾰκοντα, had its vowel lengthened under the influence of the following decads. But in both theories the first step remains a stumbling block. Why indeed should *τρῐκοντα have been transformed into τριᾰκοντα when "40" was τετρώκοντα so that neither it, nor πεντήκοντα could suggest a ntr. pl. formation ? Yet it is plain that τριᾰκοντα must have come into existence on the analogy of a closely linked numeral, and that can only be "40"; the relation πέντε: πεντήκοντα could only have strengthened the existing relation τρῐ̆: *τρῐκοντα. We are thus forced to conclude that "40" had a characteristic *ā*, in other words that IE **kʷetwr̥̄kont-* developed into *τετϝρᾱκοντα. This form then "induced" the analogical τρι-ᾱ-κοντα just as τριᾱκόσιοι "300" changed the old *δικόσιοι "200" to δι-ᾱ-κόσιοι. The change from *τρῐκοντα to τρι-ᾱ-κοντα was the more readily executed as *τρῐκοντα was, in the number of syllables, out of step with the following decads. Subsequently, *τετϝρᾱκοντα itself was refashioned in Eastern Greek to *τετϝᾰρᾰκοντα[68], clearly under the influence of the normal paradigm *τέτϝορες-τέτϝαρα (or *τέτϝαρ-ες/α)[69].

How does Western Greek τετρώκοντα fit into this picture now ? It would be easy, but very unsatisfactory, to follow Schwyzer and say that *r̥̄* could develop either into ρω or into ρᾱ, or perhaps even into other forms[70]. If we prefer to regard *τετϝρᾱκοντα as the probable development in Western Greek, too, we must conclude that the change of -ᾱ- to -ω- was due to "80", most likely at a time when this still had the form *ὀκτώκοντα.

[65] See Meillet, Introduction[8] 296; Kuiper, Mededel. Kon. Nederlandse Akad. 18/11, 1955, 12 f.

[66] Schwyzer I 592 (but 581[4] adds τετρώκοντα as a further model) after Schmidt, Pluralbildungen 39.

[67] MU V 28; Grdr.[2] II 2, 32 f.

[68] There is no τεσσαρᾱκοντα given in Meillet-Vendryès, Traité 514.

[69] See also Ch. IV on the ordinals.

[70] Schwyzer I 360 f. Even τετϝᾰρᾱ could be regarded as "regular" on this assumption!

Baunack suggested this explanation[71] on the basis of the historical ὀγδώκοντα but this seems less likely, and has been rejected by others[72], because in historical times the WGk. form was not generally ὀγδώκοντα, as is shown by Heracl. hογδοήκοντα.

This curious difference between W τετρώκοντα and E τετϝαράκοντα, both representing independent transformations of an original *τετϝρᾱκοντα, is only natural, considering that Western Greek joined and penetrated the "Eastern" area only about 1200 B. C., by which time the "Eastern" area had seen a long period of unity under Mycenaean rule. But even in Eastern Greek a similar type of change occurred in historical times.

For the numeral "40" appears in the form τετρώκοντα in Ionic also, in the ordinal τετρωκοστός. To be sure, this form occurs once only, in an inscription of Mylasa from 360 B. C.[73], and to label it "Ionic", as if it were general Ionic, is surely misleading. It is clear that the form represents a new refashioning, after Ionic ὀγδώκοντα (< ὀγδοήκοντα), of τετράκοντα, attested in WIonic. The proper name Τετρηκοστή is from the same base, but fashioned after τριηκοστή[74] and πεντηκοστή.

In Celtic, IE **k^{w}etwṝkont-* developed into **k^{w}et(w)rākont-* in the first place. We have seen that in British, under the influence of **oxtamūkont-*, **petrākont-* was replaced by **petramūkont-*, changing, in its turn, the inherited **trīkont-* to early Welsh **trīmūkont-*. In Goidelic the same kind of influence from **oxtūkont-* may have resulted in **k^{w}etrākont-* being transformed into **k^{w}etrūkont-*. But OIr. *cethorcho* may just as well continue the inherited **k^{w}etrākont-*. For the syncope of unaccented *ā*, and the svarabhakti-vowel *o* from secondary *ɣ*, cp. *ecolso*, the gen. of *ecl(a)is* "church" after the *-i*-stems, beside *ecilse* after the *-iā*-stems, both showing that the svarabhakti-vowel is determined by the following vowel (and its influence on the preceding consonants), as is also clear from *accaldam* "addressing" from **aggl̥dam* < **ad-glādam-*, *comalnad*: *comlān* "full"; the svarabhakti-vowel *o* is also illustrated by the comparative *sonortu* in contrast to the positive *sonirt* "strong"[75].

[71] KZ 25, 1881, 235.

[72] Schmidt, Pluralbild. 192[1]; Brugmann, MU V 29. Baunack's explanation was revived by Hirt, Handbuch der griech. Laut- und Formenlehre, 1912[2], 444, and Meillet-Vendryès, Traité 514, in spite of the fact that the Heraclean tablets, from which they quote τετρώκοντα, also have hογδοήκοντα not ὀγδώκοντα.

[73] Schwyzer, Delectus 746 B 1.

[74] Bechtel, Die griech. Dialekte III, 1924, 158; Schwyzer I 592 fn. 2.

[75] See Thurneysen, GOI 70. 186; Lewis-Pedersen, 72 f. (§ 106. 2). Cf. also the discussion of **k^{w}etrukont-* under "70".

Arm. *k'aṙasun* requires a more detailed discussion. It is usually derived from IE **(k^w)twṝ-kont-*, since *tw* normally results in *k'*, and *ṝ* seems to give *ar*, cf. *armukn* "elbow": Skt. *īrma-* "arm"[76]. Meillet simply posits **twṛ-* for *k'aṙ-*[77]. But both basic forms are so strange from the point of view of Indo-European that one must ask whether they are necessary at all. For Brugmann his primitive form was unavoidable because he taught[78] that IE *k^{w}e* resulted in Arm. *ç̌e* of which there is no trace in *k'aṙasun*. But Meillet expressly denied that *k^{w}e* could ever result in anything but *k'e*[79] and thus he would have been able to explain *k'*. He was, however, misled by his interpretation of *ç̌ork'* "4", which in his view could only derive from IE **ktwores*, since **k^{w}etwores* would have led to **k'ek'ork'* because "*t* et à plus forte raison *tw* ne semblent pas tomber entre voyelles"[80].

That Meillet's view of the development of IE *k^{w}e-* is untenable, has recently been shown by Pisani who demonstrated the soundness of Brugmann's doctrine[81]. Accordingly, to account for the absence of IE *tw* in our numeral, he first suggested[82] that it was dissimilated by *k^w-*, helped by an attempt to match the monosyllabic structure of the following numerals. Later he thought[83] that *-two-* as a whole was lost by a sort of haplology. So he was forced to say that *o* in *ç̌ork'* is not the original *o* of **k^{w}etwores* but secondary, due to the fact that *k^{w}e-* gave *k^{w}o-* after *e* had at least set off the palatalization of the preceding labiovelar[84].

These explanations are manifestly erroneous. We must start from the three facts indicated by *ç̌ork'*. 1) IE *e* palatalized *k^w (ç̌)*; 2) *-o-* shows the survival of IE *-o-* in the second syllable; 3) IE *-tw-* is lost. As to the third point, we know that *-tw-* developed into *k'* and could not have been lost. But intervocalic *-t-* develops differently. To be sure, Meillet taught that

[76] Brugmann, MU V 30 f.; Grdr.^{2} I 305, 476.

[77] Meillet, Esquisse d'une gramm. comp. de l'arménien classique, 1936^2, 100. Strangely enough, Pisani accepts this construct (Ricerche Linguistiche 2, 1951, 58 fn. 1) and even goes so far as to suggest that Lat. *quadrāgintā* represents **twarāgintā*, with *ar* from *ṛ* before a vowel, and *quartus* a form **twartos*, both having later replaced *tw-* by *qu-* from **quettuor*; **quarāgintā* then acquired the *-d-* also found in *quadrātus* etc., and changed **quettuor* to *quattuor*. Winter also starts from **tw-*, see Language 31, 1955, 8.

[78] Grdr.^{2} I 619.

[79] Esquisse 29 f., 54.

[80] Esquisse, l. c., and already MSL 9, 1896, 158.

[81] See Ricerche Linguistiche 1, 1950, 165 ff.

[82] Ric Ling 1, 166.

[83] Ric Ling 2, 58 fn. 1.

[84] Ric Ling 2, 58.

intervocalic *-t-* developed into *-t'-* but in the (original) penult became *-y-* which survived as such after the loss of the vowel of the final syllable[85]. However, Pisani has proved that intervocalic *-t-* generally developed into *y* or *w*, depending on the quality of the following vowel[86]. It is therefore clear that for *č̣ork'* we must start, not from IE **k^{w}etwores*, but **k^{w}etores* in which the "second" *w* was lost by dissimilation; in view of the numerous points of agreement between Armenian and Greek, it is interesting to note that the same dissimilation occurred in Doric τέτορες, in contrast to EGk[87].

Our view of the further development of early Armenian **k^{w}etores* must obviously depend on the view taken of the development of intervocalic *-t-*. Fortunately there are only two alternatives to consider. If Pisani is right in maintaining that intervocalic *-t-* before a following *o/u* developed into *w*, then the dissimilated **k^{w}etores* regularly gave **č̣eworek'*. What happened to intervocalic *-w-*? It has recently been argued — against Meillet[88] — that (original) *w* between vowels always developed into *g*[89]. But no mention is made of Meillet's attractive interpretation of *hoviw* "shepherd" as deriving from **owi-pā*[90] whose *w* always was between vowels. Moreover, *nor* "new": Gk. νε(ϝ)αρός, *sor* "hole" *(*k̂owor-)*: Lat. *cauerna*, *erkan* "millstone" from **erkawan-*[91], and the genitives of the type *alber* "well', *aler* "flour"[92], from **albewar(os) *alewar(os)*, together with the instrumentals *alberb alerb* from *-ewarbi*, clearly show that *-w-* was, in certain circumstances at any rate, lost with subsequent contraction. To say that the primitive forms were **newəros *kewəros *bhrewər* in which *ə* had acted in a special way on the preceding *w*[93], does not help since *ə* had developed into *a* and this could not have had any special ef-

[85] Esquisse 33.

[86] Ric Ling 2, 70; *t'* is only found after diphthongs, a variant that does not concern us here. Note, however, that Winter, Language 31, 1955, 7, like Brugmann, and Pedersen, KZ 39, 1906, 396, acknowledges *-y-* only.

[87] Lejeune, Traité de phonétique grecque, 1955², 72 (71 fn. 7) and Burrow, Sanskrit 258, go too far. The loss of *-w-* in all-Greek τέτρατος is due to the cluster *-τϝρ-* from *-twr̥-* (see Myc. *kwetro-* above under "90") while τέταρτος is assimilated to τέτταρες etc.

[88] Esquisse 50.

[89] Pisani, Ric Ling 1, 185; Bolognesi. 3, 1954, 129.

[90] Esquisse 31. "Attractive" in spite of Hübschmann, Armen. Gramm. I, 1897, 468.

[91] Meillet, MSL 15, 1909, 354.

[92] See Meillet, Altarmenisches Elementarbuch, 1913, § 54.

[93] Pisani, Ric Ling 1, 185.

fect. We must acknowledge that certain sequences — apparently *ewa, owa, awa* — after loss of *w* suffered contraction.

Nor need this be surprising. We know that **treyes* became **reye* > **eree* > *erek'*; **bhosog^{w}o-* "bare-footed" developed into *bok*[94]; the oblique stem of *kin* "woman", **kanay-an-* became *kanan-*[95]; the oblique stem of *hayr* "father", **hayar-* from **patr̥*, became *har-*[96]. While in these cases the vowels are alike, unlike vowels are contracted in *garun* "spring", *ariwn* "blood", from earlier **gehar *ehar* (IE **wesr̥ *esr̥*)[97], in which cases, of course, I would assume assimilation to **gahar *ahar* in the first instance, just as the mysterious *tasn* "10" is, in my view, simply **tasan*, with assimilation from **tesan* < **dekm̥t*. But there are further instances where unlike vowels were contracted, obviously with preceding assimilation. The most important instance is the nom. pl. of *k'oyr* "sister", *k'ork'*, which derives from **swesores* and has *o* from *eso*. This is then a perfect parallel to *č'ork'*: just as **swesores* developed, through **khehorkh*, into *k'ork'*, so did **k^{w}etores*, through **č'ework'*, into *č'ork'*[98].

The parallels given clearly apply even though the *-w-* in **č'ewor-* is secondary. If, on the other hand, an intervocalic *-t-* generally developed into *-y-*, there is no difficulty in tracing *č'ork'*, through *č'eyor-*, to **k^{w}etores*[99].

These results enable us to give a satisfactory explanation of the puzzling *k'aŕasun*, for which **k^{w}tw̥r̥* or **tw̥r̥* are obviously out of the question. Starting from the only established form of "40", IE **k^{w}etw̥r̥komt-*, we can now see that, with the same dissimilation as in **k^{w}et(w)or-*, Armenian first had **k^{w}etar-*, from which by assimilation — as in *tasn garun ariwn* — **k^{w}atar-* developed before the palatalization of *k^{w}e-*. After the change of intervocalic *-t-*, this developed into **k'ayar* and eventually contracted into *k'ar-*, just as IE **k^{w}āwn̥t-* developed into **k'awan* and eventually

[94] Pisani, Ric Ling 2, 63; Meillet, Esquisse 38 *[*bhosogo-]*.

[95] Meillet, Esquisse 84, but especially Pisani, Ric Ling 1, 182.

[96] Pisani, Ric Ling 1, 180, clears up the "difficulté" of Meillet, Esq. 81. But for the plur. *hark'* I would start from **pateres* which gave **hayerk'* > **haerk'* > *hark'*.

[97] Meillet, Esq. 38 f.; Pisani, Ric Ling 2, 63.

[98] Winter's discussion of the palatalization, o. c. (see fn. 86), p. 6, is written without knowledge of Pisani's important papers.

[99] Before Meillet's writings this was the general view, codified by Brugmann, Grdr.[2] I 619. 527. Pedersen (KZ 39, 1906, 396) also assumed *t* > *y* and derived *č'ork'* from **k'eyork'* with contraction of *eo* after the loss of *y*; he accounted for the loss of *w* in **k^{w}etwores* by a refashioning after a fem. **k^{w}etosres*, but in that case why do we not find *ŕ* ? On *č'* cf. also Bonfante, Mélanges Pedersen, 1937, 27 f.; JAOS 65, 1944, 183 fn. 72.

k'an[100]. The *ṙ in k'aṙ-* is still not quite clear, since none of the usual sources is available here[101], while *-a-* clearly represents the ubiquitous compositional vowel.

30 Gk. τριᾶκοντα, Lat. *trīgintā*; OIr. *trīcho*, Breton *tregont*, OWelsh *trimuceint*; Arm. *eresun*.

Greek τριᾶκοντα as we have seen, cannot represent an IE **triyākont-* but must be transformed from an original **trīkont-* which is preserved in Lat. *trīgintā* and OIr. *trīcha* (from **trīkont-s*). The OIr. word is usually quoted as *tricha*[102] but O'Rahilly has recently shown[103] that the correct form was with *ī*, in best accord with the i longa of Gallo-Lat. *trIcontis* (in the phrase *OMNIBUS TRICONTIS* "in all the months with thirty days"[104]) and with Mid. Ir. *trīcha*. It has also been noted that if the OIr. form had started from **trĭ-kont-*, we should have OIr. *trecho*[105]. OWelsh *trimuceint* also reflects a refashioned **trīkont-*[106], and the same is true of Breton *tregont*, in which, however, the original *trī-* was replaced by the normal compositional form *trĭ-*.

[100] I would add here that if **k^{w}etwr̥-* developed into **k^{w}etwar-* in the first place, a different development might be conceivable: the latter, assimilated to **k^{w}atwar-* could have given **k'ak'ar-* and, by haplology, *k'ar-*. Since, however, **k^{w}etwor-* must have lost its *-w-*, this seems to me less likely. Pisani's latest attempt (Paideia 14, 1959, 171) to trace *k'aṙa(sun)* to IE **k^{w}twṛa*, still seems to me unacceptable from the point of view of Indo-European.

[101] The suggestion that *ṙ* reflects the IE fem. (see fn. 99), repeated by Pisani, AGI 21, 1927, 50, is unlikely since there is no trace of it in "4".

[102] Pedersen, VKG II 130; Lewis-Pedersen, 189; Thurneysen, GOI 247.

[103] Celtica 1, 1946 – 50, 356 f., esp. 359; but see also 391 (?). Pokorny, IEW 192, gives *trīcho*, but derives *ī* from *trī*; see, however, ZCP 25, 1956, 318.

[104] CIL XIII 2494; cf. Loth, CRAI 1909, 24.

[105] See the translators' note, GOI 679 ad 247. Pedersen (VKG II 131) assumed a primitive form **trijukonts*! Cf. Études Celtiques 8, 1958, 238.

[106] See above under "70". I should mention here that the word *trychwn* is interpreted by J. Lloyd-Jones (Bulletin of the Board of Celtic Studies 14, 1950, 36 f., after Anwyl, Trans. Cymmr. 1909 – 10, 124) as a deformation of an original **trycwnt*, corresponding to Bret. *tregont*. The word occurs three times in the *Canu Aneirin* (ed. I. Williams, Cardiff 1938, ll. 181, 344, 1138) and in the editor's view means *tri phennaeth* "three chiefs" (p. 163 ad 344). However, in the phrase *pymwnt a phymcant. trychwn a thrychant* "50 and 500, . . and 300" (ll. 180 – 1) it is tempting to admit Lloyd-Jones's suggestion. But even if we started from a form **trikont-*, represented by Bret. *tregont*, we should expect **trigwnt*, not *trychwn*; the absence of the final *-t*, especially when in the preceding line (180) we have *pymwnt*, is also rather surprising. It remains therefore doubtful whether *trychwn* can be regarded as "30", although the fact that we have OW *trimu-*

Arm. *eresun* represents an earlier **eri-a-sun*. This is clearly remodelled from an inherited **trī-kont-* which in a purely phonetic development would have resulted in **eri-sun* and eventually **ersun*. The refashioning must have taken place at the stage **eri-sun* and *-a-* is obviously the usual compositional vowel, also found in "40" and "70". It has been suggested that *-a-* could represent the ntr. pl. ending in IE **triyə*[107] but this seems very unlikely, partly because the IE form was **trī*, partly because this explanation cannot apply to "40" and "70".

20 WGk. Boeot. Thess. Ϝίκατι, Att. Ion. Lesb. Arc. εἴκοσι (from ἐϜῖκοσι); Lat. *uīgintī*; OIr. *fiche*, OW. *uceint*, Corn. *ugans*, Bret. *ugent*; Arm. *k'san*.

The combined evidence of these forms — together with that of Aryan and Tokharian — leads to an IE **wĭkn̥tĭ*. Both the first and the final *i* are transmitted with varying quantity. The first *i* is shown to be long by Latin and Greek, cf. especially the late spelling of Heracl. Ϝείκατι[108] and

ceint need not be fatal to the theory. It would only mean that an old **trīkont-* and a new, analogical, **trīmūkont-* existed side by side for some time.
Another form worth discussing is *pymwnt* of which I have seen no detailed explanation. Thurneysen (GOI 247) appears to assume that **k^{w}enk^{w}(ēk)ont-* became **k^{w}enk^{w}ont-*, which is hardly possible. It seems obvious that *pymwnt* is the direct continuation of IE **penk^{w}ēkont-*, but the question is: how? The IE form would, by the end of the 5th c., become **pimpīgont-*, and by the middle of the 6th c. the internal *i*, treated as a compositional vowel, would be lost (Jackson 650 f.), so that "50" would appear as **pimpgwnt* (for *-w-*, see Jackson 272 f.). The next problem is: what happened to *-pg-*? Going by the parallel of *antetertiam* > *antedertiam* > *antdert* > *anterth* "forenoon" and *antecēnium* > *antegēnium* > *antgēn* > *anccẹ̄n* > *ancwyn* "dessert" (Jackson 497 f.), we would expect **pimpgwnt* to result in **pimccwnt* > *[pinkunt]* which can hardly have given *pymwnt*, because it would not have developed into *[pinunt]* the form necessary for the explanation (*pin-* being later replaced by *pym-*). On the other hand, *Anghrist* from Lat. *Anticristus* does show the expected development and so we may assume that **pim(p)kunt* became **pinhunt* by the end of the 8th c. (Jackson 505) and later the first element, always felt to be identical with "5" was replaced by the current form resulting in *pym-wnt*. I would add that the change to *pym-* would obviously be easier if *pynhunt* had already lost its *h*. If the accent-change on which the loss of *h* depends did not occur before the 11th c. (Jackson 506), the transformation to *pymwnt* would be even later. In any case, *pymwnt* in the Canu Aneirin cannot go back to the 6th c.; it must be an intrusion in the manuscript tradition of a rather later form.

[107] Cf. Brugmann, MU V 28; Grdr.^{2} II 2, 33; Meillet, Esq.^{2} 164.

[108] Heraclean Ϝείκατι (alternating with Ϝικ-) has ει from the Attic-Ionic form.

Lacon. βείκατι[109]. Celtic, at any rate Old Irish, requires *ĭ* but this can easily be understood as due to analogical influence from the compositional **dwi-*, although, of course, an IE **wĭ-k-* could just as easily have been lengthened in some areas to **wīk-* under the influence of the following **trī-k-*. The final *i* is short in Greek and Aryan but long in Latin and, on account of the *-i*-affection[110], in British. The long *i* could conceivably be explained in Latin as due to the analogy of the following decads with *-ā*, but this is not true of British where such forms never existed. On the other hand, shortening in Greek and Aryan is paralleled in other cases. Thus Gk. δύο, beside δύω and general δώδεκα, cannot represent something "uralt"[111], but must be secondarily shortened. Similarly, Aryan (Skt.) *-ti* from *-tī* is well-known[112]. Under these circumstances, the evidence of Latin and British seems to be preferable, and so the most likely form of "20" was IE **wīkm̥tī*.

*

As can be seen, the changes that have been introduced in the system of decads even in those languages which have preserved the original system without abandoning its basic principles, are far-reaching and complex. It will therefore be useful to tabulate these changes indicating, as far as possible, the lines of interactions.

The Indo-European system is represented by the following series:

"20"	**wīkm̥tī*	"60"	**s(w)ekskont-*
"30"	**trīkont-*	"70"	**septm̥̄kont-*
"40"	**kʷetwr̥̄kont-*	"80"	**oktōkont-*
"50"	**penkʷēkont-*	"90"	**newm̥̄kont-*.

[109] Hesychius, ed. Latte, I, 1955, 321.

[110] Jackson 574, 579.

[111] As suggested by Schwyzer I 588. Arm. *erko-tasan* "12", often invoked to prove an IE form **dwo-* (cf. Meillet, MSL 12, 1902, 226 f.; BSL 21, 1919, 273; Esq.[2] 99. 143; and more recently Benveniste, BSL 43/2, 1947, 37), suffers from the disability of occurring in "12" only where Greek has δ(*F*)ώδεκα, Sanskrit *dvādaśa*, which makes it unlikely that the Armenian form should be an archaic form. The explanation must start from the fact that IE **dwōdekm̥t* would have resulted in Arm. *erk(u)tasan* and it is clear that in order to avoid the reduction, *-o-* was introduced, perhaps from a descendant of IE **dwoyo-* (which would have resulted in Arm. **erko-*!). Note also that in Slavic compounds, among others, the form *dъvo-* is found (OCS *dvo-deseṭьnъ* "uigesimus", *dъvo-dušьje* "doubt"), where no one would think of tracing the form to IE.

[112] Cf. Wackernagel-Debrunner, AiGr. III 145, § 73 a α): *-ti* from *-tī*; F. B. J. Kuiper, Shortening of final vowels in the Rigveda (Mededelingen der Koninklijke Nederlandse Akademie, 18/11), 1955, 2 ff.; Lingua 5, 1956, 322.

The Greek developments, exhibiting considerable analogical changes, can be illustrated as follows[113]:

*Fῑκατι	(ἐ)Fῑκοσι[114]	εἴκοσι
*τρῑκοντα →	τρι-ᾱ-κοντα	τριᾰ́κοντα
*τετFρᾱκοντα →	τετFᾰ́ρᾰκοντα	τετταράκοντα (-σσ-)[115]
*πεντήκοντα →	πεντήκοντα	πεντήκοντα
*ἑσκοντα →	ἑξ-ή-κοντα	ἑξήκοντα
*ἑβδμᾱκοντα ↓	ἑβδομ-ή-κοντα	ἑβδομήκοντα
*ὀκτώκοντα ↓	ὀγδοF-ή-κοντα	ὀγδο(F)ήκοντα (-ω-)
*ἐνFνᾱκοντα ↓	ἐνFαν-ή-κοντα	ἐν(F)ενήκοντα

Apart from changes in the second component, analogy played a very small part in Latin:

**wīkentī (ī-e-ī > ī-i-ī:)*	**wīkintī* →	*uīgintī* ↓
**trīkenta* →	**trīgenta* →	↓ *trīgintā*
**kwadrāgenta*[116] →	**quadrāgenta*	↓ *quadrāgintā*
**kwenkwēkenta* →	**quinquāgenta*	↓ *quinquāgintā*
**sescenta*	↑ **sex-ā-genta*	↓ *sexāgintā*
**sept(a)māgenta*[116] →	**septu(w)āgenta*	↓ *septuāgintā*
**oktōkenta* →	**oktōgenta*	↓ *octōgintā*
**neunāgenta*[116] →	**nounāgenta*	*nonāgintā.*

As concerns Celtic, we must ignore here the problems connected with the second[117] part. It will be enough to start from *-kont-*. Goidelic and British are better treated separately.

Goidelic:

**wĭkent(i)*	**wikēdd-*	*fiche(t)*
**trīkont-*	**trīkodd-*	*trīcho(t)*
**kʷet(w)rākont-*	**ketr(a)kodd-*	*cethorcho(t)*
**kʷenkʷēkont-*	?[118]	*cōico(t)*

[113] The forms placed in the same column are not (necessarily) contemporary.

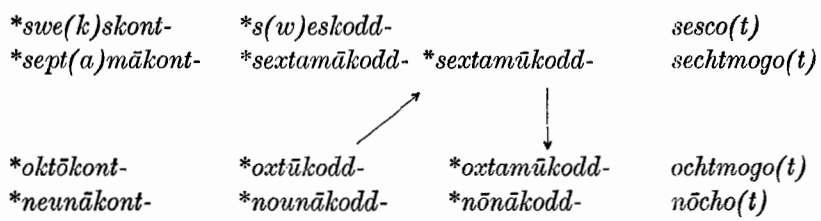
[114] Not, of course, in Western Greek which "arrived" after the important Eastern Greek change -τι > -σι.

[115] WGk. *τετFρώκοντα after "80".

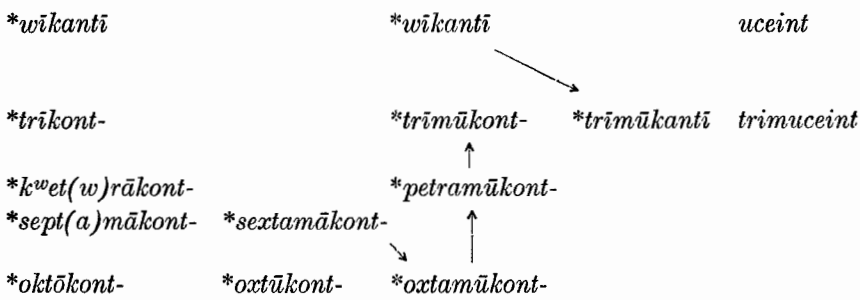
[116] I assume that *-k-* was voiced after the long sonants *r̄, n̄*, see Appendix 2. On *-konta* (or *-ken-ta*) see Ch. V, pp. 127 f., 133 f., and Ch. II, p. 34 with fn. 33.

[117] See Ch. V, pp. 116 f., 132.

[118] For the disputed development see Thurneysen, GOI 246 f., and fn. 106 above.



For *British* only the following points should be noted:



The Armenian results can be tabulated as follows:

**wi-san(ti)*	**gi-san*	*k'san*
**eri-sun(t)*	**eri-a-sun*	*eresun*
**kʷet(w)ar-sun(t)*	**k'ayar-sun*	*k'ar-a-sun (-ṙ-)*
**henkē-sun(t)*	**hing(i)sun*[119]	*y-isun*
**heptan-sun(t)*	**ewt'a(n)sun*	*ewt'a-n-a-sun*
**optū-sun(t)*	**owt'(u)sun*	*ut'sun*
**enewan-sun(t)*	**inūn-sun*	*innsun.*

[119] This is Meillet's view of the development (Esq.[2] 30 f.), based on the assumption that *kʷe-* and *-kʷe-* are not palatalized in Armenian. But, as we have seen above (p. 19), *kʷ* did palatalize in such cases. Pisani is right in insisting that *hing* "5" shows no palatalization because *-e* was lost earlier, and that *hngetasan* "15" has its *-g-* from "5" (Ric Ling 1,1950,165 f., esp. 168); but he does not seem to discuss *yisun*. Now in the case of IE **penkʷēkont-* the palatalization led to **hinčēsunt*, **hinčisunt* in the first place. It is obvious that this form, after the loss of *-i-*, developed into **hinčsun*, from which **hinsun*, and eventually *y-isun* arose.

CHAPTER II

The decads in Germanic

The other Indo-European languages, with the exception of Tokharian, show a more thorough-going rebuilding of the decad-system. Since, however, all of them, but especially Aryan and Germanic, have preserved ample traces of the inherited system, we must try to understand their innovations as due to some secondary defects which became apparent and demanded a new build-up in the course of development. We shall start with the Germanic languages since they still afford confirmation of the system of higher decads as reconstructed in the preceding chapter.

* * *

At first sight, the Germanic languages show little connection with the inherited IE system. The numbers "20 — 60" have everywhere given way to new combinations consisting of the digits and a *-u*-stem **tigu-* "ten". The system is at its clearest in Gothic where we have: *twai tigjus* "20", *þreis tigjus* "30", *fidwor tigjus* "40", *fimf tigjus* "50" and *saihs tigjus* "60". Apart from minor details, the West and North are in full agreement with this system. But after "60" it is only in the North that we find the same principle carried through; cf. ONorse *siau tiger, átta tiger, nío tiger*, and even *tío tiger, ellefo tiger*.

In the West and East we find a remarkable change. In Gothic we have: *sibuntēhund* "70", *ahtautēhund* "80", *niuntēhund* "90" (and *taihuntēhund* "100")[1]. In the West the system is slightly different and even varies from dialect to dialect. Thus we have the following series:
Old High German: *sibunzo* "70", *ahtozo* "80", **niunzo* "90", *zehanzo* "100";

[1] I use the macron in *-tēhund* to indicate the etymological value, without wishing to prejudge the question whether quantity was a relevant feature in the phonological system of Gothic; cf. J. W. Marchand, Vowel-length in Gothic, General Linguistics I 3, 1955, 79 – 88.

Old Saxon: *ant-siƀunta* "70", *(ant-)ahtōda* "80", *nigonda*[2] "90" (and *hund* "100");
Old English: *hund-seofontiȝ* "70", *hund-ēahtatiȝ* "80", *hund-niȝontiȝ* "90" (and *hund-tēontiȝ* "100").

The variations within West Germanic are plainly secondary and can, for the present, be ignored. But even if we compare the simplest WGmc system, that of OHG, with Gothic, we find certain differences which make it advisable to start from Gothic as being the clearest.

On the face of it, the Gothic system seems to continue the one used in "20 — 60", with the difference that from "70" onwards instead of the separate noun **tigu-* a compositional element *-tēhund* is found. Since *tēhund* is fairly close to *taihun*, it is not surprising that *tēhund* was already regarded by Bopp as representing the same word (in fact, the ordinal)[3]. This theory was taken up by Schleicher[4] and impressively developed by J. Schmidt[5]. According to Schmidt, *tēhund* is a lengthened-grade collective (IE **dēkm̥tom*) from the abstract **dekm̥t*, a formation paralleled by Skt. *sáptām* "heptad": *saptá* "seven". In order to account for the divergent forms of WGmc, based on *-tōhund* not *-tēhund*, he assumed that there existed a periphrasis *tehun-tēwi hund* "zehnreihiges Hundert" — "hundred in the decimal system" in contrast to "120" = "hundred in the duodecimal system" — which developed into WGmc **tehuntāw(i)hund* and, eventually, **tehuntohund*, from which it then spread to "70 — 90"[6].

Against this theory the following fatal criticisms can be directed:
1) IE *dēkm̥tom* is non-existent and unlikely;
2) The Eastern and Western types are separated although *sibuntēhund* — *sibuntōhund* are patently the same formation;
3) The development *-tēwi* > *tao* > *to*, assumed for WGmc, is impossible[7].

[2] On this form see Rosenfeld, Zahlen 191 A.
[3] Vergleichende Grammatik[2] II, 1859, 86 f.
[4] Compendium[3], 1871, 487.
[5] Urh. 26.
[6] Urh. 29 f. — The account given by Kieckers, Handbuch der vergl. got. Gramm., 1928, 179, is a garbled version of Schmidt's thesis, who used *-tēw-hund* only for WGmc.
[7] See Brugmann, MU V 11; Streitberg, Urgermanische Grammatik (= UG), 1896, 221; v. Helten, IF 18, 1905, 118; Pisani, RAL 6/8, 152; Rosenfeld, Zahlen 171–2. 175. — Schmidt's view is still accepted by Jellinek, Gesch. d. got. Spr., 1926, 140 (followed by Kieckers, o. c., 178 f.) who derives both Goth. *-tēhund* and WGmc. *-zo(hund)* etc., from *-tēw(i)hund*; and quite recently by Pokorny, IEW 191; Krause, Handbuch des Gotischen, 1953, 177. 178; Wackernagel-Debrunner, AiGr. II 2, 1954, 105. 115 (but cf. 933). P. Thieme has suggested (KZ 69, 1951,

In view of the insurmountable difficulties other scholars have considered a different division. Thus Wheeler and, independently of him, Brugmann suggested that the division was *sibuntē-hund* etc.[8] In Brugmann's view, in *taihuntēhund* "100" *taihunte* is the gen. pl. of a Pre-Gmc. **dekm̥d-* = Gk. δεκαδ-, while *hund* = IE **kṃtom*, but in the primitive meaning "decad", so that the meaning of the phrase was "a decad of decads"; after *taihuntēhund* were formed the new *sibuntēhund niuntēhund* (and later still *ahtautēhund*) since *taihuntēhund* is proved to be the oldest member of the series by the fact that **dekṃt-* is presented by Aryan-Greek-Germanic-Balto-Slav, while **septṃt- *newṇt-* are only Greek and Germanic[9]. This logical picture is modified in the Grundriss[10], where Brugmann starts from *sibuntē-hund* and holds that *taihuntēhund*, his former starting point, was built after *niuntēhund*.

This view has met with great favour and many authorities have adhered to it even in recent times[11]. Nevertheless, there are obvious difficulties which, in my view, are sufficient to disprove it:

1) Brugmann's assumption that Primitive Gmc. **hunda^n* still meant "a decad" is untenable since the only meaning **kṃtom* has in all IE languages is "100"[12]. Besides, it is incredible that in the phrase "a decad of decads" Germanic should have used two different words for "decad": **dekm̥d-* and **kṃtom* (or rather **tehund-/hund-*); it would have been more logical to start from **dekm̥dōm dekm̥d* which would have given Gmc. **tehunt^ē/$_ð$tehunt* and with haplology **tehunt^ē/$_ð$hun(t)*. To avoid this difficulty, Prokosch — who, firmly believing that by a comparison of *sibuntē-* and *sibunzo* "Brugmann's analysis is as good as proven"[13], suggests that "Gmc. *hund* did not necessarily mean '100' but could be applied to any of the decads from 70 to 100"[14] — declares that his interpretation "does not

210[2]; Sächs. Ber. 98/5, 1952, 65) that Schmidt's theory was supported by compounds of the type of Skt. *dvisāhasra dviśāta-māna-* etc.; but if the vrddhi were IE, would we not find **dvisāṁhasra- *dvi-śānta-* from IE **sēmgheslo- *kēnto-*?

[8] Wheeler, Der griech. Nominalaccent, 1885, 38: *taihuntehund* = τῶν δεκάδων ἑκατόν; Brugmann, MU V 11 f. (cf. 139 on Wheeler's priority).

[9] MU V 16.

[10] II[2] 2, 35 f.

[11] Cf. v. Helten, IF 18, 1905, 118 f.; Meillet, Caractères généraux des langues germaniques, 1926[3], 223; Prokosch, A comparative Germanic Grammar, 1939, 288; Braune-Helm, Gotische Gramm., 1947[12], 80.

[12] Cf. Schmidt, Urh. 39 (= 37[1]); Streitberg, UG 220; Kieckers, Hb. 178.

[13] O. c., 290.

[14] O. c. 289. Nevertheless, he states (p. 290) that *sibunte-hund* is "a hundred consisting of groups of seven, ein Siebener-Hundert"!

impute the meaning 'decad' to *hund*; it merely assumes that its meaning was elastic"[15], a way out that is too sophisticated and, at the same time, too loose to carry conviction. Sommer, on the other hand, reverts to Wheeler's interpretation and holds that the increasing use of "*hundred*" in the sense of "great (or long) hundred" (= 120) necessitated the introduction of an unequivocal expression for "100", and the phrase **texuntōn χunðan* "(τὸ τῶν) δεκάδων ἑκατόν", originally "das Hundert der Zehnerreihe" (i. e. "a hundred in the decimal system"), was bound to be understood as "ten decads", thus giving rise to the new phrase **niuntōn χunðan* "nine decads", and then to the corresponding phrases for "70" and "80". At the end of this development *hund* clearly acquired the meaning "decad"[16]. Sommer's modification of the Wheeler-Brugmann theory is undoubtedly a great improvement. But since Germanic inherited the IE type of decads in *-hund* (or sim., from IE *-kont-*), the meaning of which must always have been quite clear to the speakers, there is no need to assume a "reinterpretation". We shall see presently that even from the formal point of view the assumption is unnecessary.

2) One, perhaps the only, attractive feature of Brugmann's explanation is that it can account for the difference between Gothic and WGmc. The Gothic gen. pl. **sibuntē* corresponds with OHG *sibunzo*, OE *seofonta*, as does Goth. *frijondē* with OHG *friunto*, OE *frēonda* "of friends". But here again, the basis of the construction, the collective **tehunt-* from an IE **dekm̥d-* is unacceptable. Brugmann, and after him Sommer, insisted that Gk. δεκάδ- and Skt. *daśát-* guaranteed an IE collective **dekm̥t-* and that *d/t* reflected an IE alternation[17]. But the fact is that, apart from the Gmc. **tehunt-* which has to be proved, it is only in Greek that we find *-d-* while Skt. *daśát-*, Slav. *deseţ-* and Balt. *dešimt-* clearly show IE *-t-*. There can be therefore no doubt that Greek -δ- represents a secondary, Greek, and not an IE, change[18], and in Greek it fits into a broader context since *-t-* is, after a short vowel (even from *m̥*), generally replaced by -δ-[19]. This change was fairly easy in **dekm̥t-* where acc. **dekm̥tm̥*, *dekm̥tm̥s*, instr.

[15] O. c., 307.

[16] Zw. 50 f.

[17] Brugmann, Grdr.[2] II 2, 36; Sommer, Zw. 18.

[18] Wackernagel-Debrunner, AiGr. III 419 clearly state that -δ- is secondary, Greek, and does not support an IE *-d-*. Cf. also our discussion of δέκατος, Ch. IV.

[19] Schwyzer, GG I 499 Zusatz, already stated by Schmidt, Urh. 27[1], but not "after 'Ελλάς, -άδος" (as now repeated by Rosenfeld, Zahlen 182).

**dekm̥tbhi(s)* naturally led to voicing[20], while in Germanic the comparable case of IE **yuwn̥t(i)-*, appearing in OHG *jugund* etc., shows no trace of a similar change. For these reasons it seems unjustifiable to project into Indo-European an "alternation" that so far has only been observed in Greek.

There is one other point that should not be passed over in silence. Brugmann's statement[21] that *sibunzo, seofonta* show the regular gen. pl. ending, ignores the fact that Old Saxon is at variance with this explanation. As pointed out by Schmidt[22], the gen. pl. ends in *-o* in OS — cp. *friundo* etc. — whereas the decads end in *-sibunta* etc. This would seem to settle the question: *antsibunta* cannot be a gen. pl., so *sibunzo seofonta* cannot be either.

3) In spite of the spirited defence, a phrase δεκάδων ἑκατόν is incredible in the IE decimal system. The same applies to ἑπτάδων δεκάς (ἑκατόν) which would only be tolerable if it were a purely formal transference from a well-established δεκάδων ἑκατόν (δεκάς).

A third view attempts to account for the difference between Goth. *-ē-*: WGmc. *-ō-* by a different method. A. Holtzmann suggested that in *sibuntē-hund* the first member represented the ordinal "7th" while the second corresponded to Gk. -κοντα so that *sibuntēhund* meant "7th ten"[23]. This theory, completely ignored since Brugmann's criticisms[24], has recently been revived by H-Fr. Rosenfeld[25]. He considers that the evidence demands a division *sibuntē-hund*, after which also *ahtautē-hund niuntē-hund taihuntē-hund* were formed; the type, he thinks, is certainly related to that of Greek and Latin, which show not only the combination of an ordinal with **komt-/km̥t-* but also that the latter was treated as a feminine (*nōnāgintā*, ἑβδομή-κοντα). He then assumes that the existence of the ordinals *fimfta- sehsta-* and *ainlifta- twalifta-* (with regular *t* after the spirant) gave rise to **sibunta-* which was combined with *hund* as a masculine of the *n*-stem, and shows the regular form of the ordinal.

Since it is now certain that *nōnāgintā*, ἑβδομήκοντα etc. do not represent a formation with the ordinal, the basis of this construct has

[20] See Szemerényi, KZ 71, 1954, 216. Note that Myc. *popi* = ποπφι (< ποδ-φι), *adirijapi* = ἀνδριάν(τ)φι, indicate complete assimilation which was surely helpful in bringing about the transfer of many *-t*-stems to the *-d*-stems.

[21] It is accepted by Sommer, Zw. 55.

[22] Urh. 39 (= 37[1]).

[23] Germania, 1, 1856, 217 f.

[24] MU V 13.

[25] Zeitschrift für Phonetik 8, 1955, 385 f. But see now Appendix *1*, p. 148 f.

disappeared[26]. But equally difficult are the assumptions that *hund* could be construed as masculine — when *-kont-* was said to be feminine in Greek and Latin — and that an ordinal **sibunta-* could have existed beside the regular **sibunda-* which completely ousted it from every other use.

All these theories, with the possible exception of the third and Sommer's circumspect treatment[27], ignore the fact that Indo-European did possess words for "70 — 90", and commit the methodological sin of omitting to ask what happened to them. This important question has been put by two scholars only, Hirt and Pisani. Hirt pointed out[28] that a division *sibuntē-hund* was indicated by the fact that *-hund* was absent from OHG, while it appeared as the first member in OE and OS. From this followed the identification of *-hund* with Skt. *-śat*, Lat. *-gintā*, and the interpretation of *-ē-* as being identical with that of πεντήκοντα etc. But here came a surprising idea: **sibunt-*, in Hirt's view, was an abstract, and originally it was such abstracts from the digits that were used for the decads; in Greek, e. g., for a time **ἑβδομᾱ* alone was used for "70", ἑβδομήκοντα is more recent. As to the difference between Goth. *-ē-*/WGmc. *-ō-*, he thought that *-ō-* could correspond with the *-ā-* of *septuāgintā*, or *sibuntē-* might have been reinterpreted as a gen. pl.

Hirt is obviously right in attempting to link up the Germanic formations with those of Latin and Greek. But his statements concerning the details are disappointingly light-hearted. His abstract **sibunt-* and the "interpretation" of **ἑβδομᾱ* are just as unfounded as the equation of Goth. *-ē-* with Gk. *-η-* but WGmc. *-ō-* with Lat. *-ā-*; if *sibuntē-*, with IE *-ē-*, could possibly be reinterpreted as a gen. pl. in Goth., this is impossible for WGmc.

Pisani's approach is more methodical[29]. Having established, on the basis of Greek-Latin-Celtic, the IE forms **septomēkomtə/septomākomtə* etc., and for Pre-Gmc. the endings *-ēkomtə/-ākomtə*, he rightly declares that "the only plausible way of explaining the Germanic forms" is to reduce them to the IE type[30]. Germanic must have had the continuations of IE **penkʷēk-/penkʷāk-*, **seksēk-/seksāk-* etc., which were divided by the

[26] It is sad to see that Sommer's important work is so little known even in his own country. Krause, l. c. (above fn. 7), seems also unaware of this work.

[27] Cf. Zw. 51 f. on the inherited numbers in *-χunda*.

[28] Indogermanische Gramm. (IG) III, 1927, 312; Urgerm. Gramm. (UG) 2, 1932, 111.

[29] RAL 6/8, 153 f.

[30] O. c., p. 154.

speakers as **penk^{w}-ēk-* etc., and this led to a general restoration of the digits in **sibun-ēhund *ahtau-ēhund *niun-ēhund *tehun-ē-hund* on the one hand, and **sibun-ōhund* etc. on the other. Of these, "80" certainly showed a hiatus, and perhaps even others (*-ų*), which eventually led to the insertion of a *-t-*, supported "by a sort of approximation in the speakers' mind between the element *-tēhund/tōhund* and the word **tehun*" (ibid.).

Here again the attempt to bridge the gap between Indo-European and the Germanic formations is obviously sound. But the assumption of an hiatus and the subsequent elimination of it by the intrusion of a spontaneous *-t-* cannot be regarded as a rational explanation and is indeed unsatisfactory. Pisani himself later modified his views on this point, assuming that *t/z* were not a spontaneous growth to delete the hiatus but transformed from *þ* or *ð* in **sibunþ- . . . *tehunþ-*, representing IE **septm̥t- . . . *dekm̥t-*[31]. But we are still not told why such a change should have taken place. Pisani obviously does not accept the view that *t/z* derive from IE collectives in *-d-* but he does not attempt to explain why collectives should turn up at all in a system in which only the digits had been in use before.

* * *

The main reason for the failure of earlier attempts is now clear. Even those who tried to establish a link with Indo-European, were bound to fail because they started from false IE premisses. From our discussion in Ch. I it is clear that the set of IE forms we have to start from, and the corresponding Germanic developments — before the operation of Verner's law — are as follows:

"10"	IE	**dekm̥(t)*	PGmc.	**texun(þ)*
"20"		**wīkm̥tī*		**wīχunþī*
"30"		**trīkont-*		**þrīχanþ-*
"40"		**k^{w}etwr̥kont-*		**feþurχanþ-*
"50"		**penk^{w}ḗkont-*		**femfēχanþ-*
"60"		**s(w)ekskont-*		**seχskanþ-*
"70"		**septm̥̄nkont-*		**seftunχanþ-*
"80"		**oktōkont-*		**aχtōχanþ-*
"90"		**newn̥̄kont-*		**newunχanþ-*
"100"		**km̥tóm*		**χunþa^{n}.*

[31] AGI 34, 1942, 15.

The combined pressure of **texun *wīχunƀ-* and **χunƀa-* led to the replacement of *-χanƀ-* in the intervening decads by *-χunƀ-*[32], so that, after the operation of Verner's law (and the change $\chi > h$), the decads appeared in the following forms:

"10"	**tehun*
"20"	**wīhund*
"30"	**ƀrīhund*
"40"	**ƒedurhund*
"50"	**ƒimfēhund*
"60"	**sehskund*
"70"	**seftunhund*
"80"	**ahtōhund*
"90"	**ne(w)unhund*
"100"	**hund*^{a}.

The final vocalism thus showed the same realignment as that of the Latin system where — whether by phonetic development, i. e. the syncope of *-kont-* resulting in *-kn̥t-*, and later *-kent-*, or by assimilation to **dekem *wīkentī . . . *kentom* — the original *-kont-* was replaced by the uniform *-kent-*[33]. The preservation of *-h-* both in Gothic and in WGmc. probably shows that, in the period before Verner's law came into operation, the accent was on the preceding vowel. Germanic would thus agree with Gk. πεντήκοντα as against Skt. *pañcāśát*[34].

In this chain, "60" was a weak link since it was the only decad in which the digit was followed by *-kund* not *-hund*. The obvious remedy was, as in Greek, to adopt the juncture-vowel of the preceding decad, and thus to change it to **sehs-ē-hund*. The result of this change was that "70" now stood between **ƒimfēhund* — **sehsēhund* and **ahtōhund*, all forms in which the characteristic *-hund* was preceded by a long vowel. Besides, the structure of **seftunhund *niunhund* was threatened by the fact that *-nh-* tended to absorb the nasal, with simultaneous lengthening of the preceding vowel, which would have led to **seftūhund *niūhund*, i. e. forms that were quite foreign to the general pattern.

[32] This assumption would be unnecessary if we could be certain that IE (also ?) had *-kn̥t-* as the second member. But this would only mean that the levelling took place at an earlier date. See on the question Ch. V.

[33] The further development of *-kent-* to *-cint-/gint-* ist due to *uīgintī* where *-e-* flanked by two *-i-*s was assimilated; the alternative, that *-kent* was syncopated to *-kn̥t-* and then regularly developed an *i*, not *e*, seems less likely.

[34] Cf. Hirt, IF 16, 1904, 84.

This pressure led to different results in the groups that became Eastern and Western Germanic. In Gothic the preceding decads imposed their vowel on "70", thus giving rise to the sequence **fimfēhund—*sehsēhund—*seftunēhund*. Now in "50 — 60" and "80" the principle was quite clear: the current form of the digits combined with *-(ē)hund* to yield the corresponding decad. Not so in **seftunēhund*. Its **seftun-* contrasted with the digit **seƀun* which replaced the inherited **seftun* owing to the dissimilation that had occurred in the ordinal **septmtos* which gave **sepmtos* > **seƀunðaz*[35]. It was thus unavoidable that **seftun-* in "70" should be replaced by the current form **sefun* > **seƀun*. But the change was not brought about by simply dropping the unnecessary *-t-*: by metathesis **seftunēχund* was changed to **sefuntēχund*, later **seƀuntēhund*.

This purely phonetic change was to have momentous repercussions in the morphological structure. For now there were two consecutive decads in which the characteristic *-hund* was preceded not only by a long vowel but also by a voiceless dental stop, unknown to any of the other decads. And since *sibuntēhund* could only be understood as *sibun-tēhund*, the following **ahtōhund* was also changed to **ahtō-tēhund* (later, in accord with *ahtau*, to *ahtautēhund*), after which even *niuntēhund*, and finally *taihuntēhund*, were formed. The latter may have been desirable because the simple *hund* began to be used increasingly also in the sense of a "long hundred", but in view of the clear series in "70 — 90" it is understandable that a *taihun-tēhund* should have been created even without such prompting.

The main point is that, as could be expected, *taihuntēhund* is at the end, not at the beginning of the development, as has been frequently maintained. Nor was there a collective **tehunt-* or, for that matter, **seƀunt-*; the latter form did exist, though not as a noun but simply as a result of a phonetic change from **seftun-* to **sefunt-*.

This theory also gives a satisfactory explanation of the divergent forms in Western Germanic. There the original position which we have to start from was:

**sehsēhund — *seftunhund — *ahtōhund — *ne(w)unhund.*

In this area, however, the inherent difficulties were mastered in a slightly different manner from EGmc. "70" and "90", flanking "80", adopted its ending and thus changed to

[35] According to the (almost) general consensus. Cf. Brugmann, IF 5, 1895, 376 f.; Streitberg, UG 217; Kieckers, Hb. 80; Pokorny, IEW 909; E. P. Hamp, Word 8, 1952, 136 – 9.

**seƀuntōhund*
**ahtōhund*
**ni(w)untōhund,*

and, in order to make "80" as transparent as "70" and "90", to

**seƀuntōhund*
**ahtōtōhund*
**ni(w)untōhund.*

To this set, as a final member, **tehuntōhund* was added as a variant of the inherited **hund.*

This is obviously the system from which all WGmc. dialects started. There is no need to labour either the *-ā-* of Latin — an impossible undertaking in any case since, as such, it is not an inherited sound in Latin — nor a mysterious IE abstract-collective in *-d-*, of which there is no trace elsewhere, nor a semantically impossible type "7th decad" etc. The divergence between EGmc. and WGmc. is merely due to the fact that the inherited system, with *-ē-* in "50" but *-ō-* in "80", and no other juncture-vowel between "40" and "90", gave two possible ways of regularization: either the extension of *-ē-* (Gothic) or that of *-ō-* (WGmc.).

However, the WGmc. dialects, though all starting with the same basic stock posited above, followed highly individual ways in their further development of the system. The continental OHG found the system of decads between "70 — 100" *overcharacterized*: all the decads ended in *-hund*, although **sibuntō *ahtōtō *niuntō *tehuntō* were sufficiently distinct to express the notions without the addition of *hund*, an element that was awkward also because it was identical with the independent word used in the same field but which obviously could not have the same meaning. Hence the simple way out of dropping the function-less *-hund* and reducing the system to the clear pattern of

*sibunzo — ahtozo — *niunzo — zëhanzo,*

which, from the 9th c., are assimilated to the preceding decads and become

sibunzug — ahtozug — niunzug — zëhanzug[36].

[36] See Braune-Helm, Ahd. Gramm., 1950[7], 225. An interesting parallel to the deliberate "detachment" of an "unnecessary" element is found in Germ. *Messer* "knife". The OHG form is *mezzirahs*, from Gmc. **mati-sahsa-* "meat-knife" (cf. OE *mete-seax*), but already in MHG the word is *mezzer*. Why was the "ending" lost ? The obvious explanation ist that the speakers, "unaware" of the "true" etymology, divided the word as *mezzer-ax*, identifying the second part with the current word *ax* "axe". It is important to note that this reinterpretation could not occur in OHG times because "axe" at that time still had the form *ackus* (:Goth.

In the coastal dialects — the "Nordseegermanisch" in contrast to "Binnengermanisch" — we find a different development altogether. There we have

OE *hundseofontiȝ — hundēahtatiȝ — hundniȝontiȝ — hundtēontiȝ*
and
OS *antsiƀunta — antahtōda — nigonda(— hund).*

The OE ending *-tiȝ* is generally agreed to be a refashioning of *-ta* after the ending of the preceding series "20 — 60", a change also noticed in OHG; the original *-ta* still appears in OS *siƀunta*, while "80" and "90" were there assimilated to the ordinals. The difference between OHG *-o*, OE (?) OS *-a* is due to divergent treatment of *ō* in middle syllables: OHG shortened it, while OS (and OE ?) weakened it to *-a*[37].

Curiously enough, OS uses for "100" the old word *hund*. It is often said[38] that this word was ousted from the singular, i. e. restricted to the combinations "200" etc., because of the emergence of Proto-Gmc. **tehuntōhund* (or **teχuntōn χunðan*). This would not in itself be impossible. But now that we have seen that **tehuntōhund* is not the starting point for "70 — 90", we shall conclude that "100" was, in some dialects, replaced by the obvious innovation **tehuntē/ōhund*, while in others, especially OS, this change never occurred.

More important and difficult is the question how OS *ant-* and OE *hund-* are to be accounted for. It seems obvious that they must be connected with the element *-hund* that had its place at the end of the expression in "70 — 90" ("70 — 100"); also that OS *ant-* is the weakened form for (OE) *hund*[39]. But why should *-hund* have been moved from the end of the

aqizi); only in MHG did this become *ackes, aks, ax*. But once the ending of *mezzirahs* had also become *-aks, -ax*, the speakers could not help interpreting *mezzir-ax* as a tautological compound and felt at liberty to drop the second, unnecessary part. This seems to me more likely than the assumption (Behaghel, Gesch. der deutschen Spr., 1928[5], 515; Kluge-Mitzka, 1957[17], 475) that the old gen. *mezzireses*, from *mezzirahs-es*, reduced to *mezzeres*, gave the new nom. *mezzer*, on the analogy of *wazzeres, wunderes*; as far as I can see, such a development has no parallels.

[37] For this cf. OS *werad* "of the people", *westrani* "Western" (Holthausen, Altsächs. Elemb., 1921[2], 48); we cannot be certain whether the OE forms replaced *-ta* or *-to*.

[38] Recently by, e. g., Sommer, Zw. 53.

[39] See Holthausen, o. c., 138, who thinks of assimilation to the prefix *and-*; v. Helten separates (IF 18, 1905, 119) *ant-* from *hund-* which seems impossible. See also Brugmann, MU V 142, and now Rosenfeld, Zahlen 194 A f.; Loewe, Germanische Sprachwiss. II, 1933[4], 83.

phrase to its head? J. Schmidt, of course, believing that in Gothic there were side by side *taihuntēhund* and *hund* **taihuntēwi* ("100 in the decimal order"), assumed the coexistence (in OE) of **tehontahund* and *hund* **tehonta*, after which to the old *sefontahund* (= Goth. *sibuntēhund*) a new **hund-sefonta* was formed, which eventually ousted the old type[40]. Sommer also thinks that the phrase **teχuntōn χunðan* must have been reversible, since the sequence in a genetival syntagma was not rigidly fixed[41]. For those who cannot believe in these primitive forms, this way out is barred. They must obviously start from **seƀuntōhund* etc., in which the sequence, because inherited, was rigid. But just as OHG clearly shows that these formations naturally divided themselves into **seƀuntō-hund* etc., in which **seƀuntō* etc. were clear by themselves and so *-hund* was felt to be an unnecessary, even confusing, addition, the same attitude must have prevailed in the speakers of the coastal dialects. There, however, the radical course, adopted by OHG, was not generally embarked upon, although OS, with its *nigonda*, was clearly not averse to the procedure. Generally speaking, however, *-hund* was not regarded as "expendable". Yet, its existence was irksome in one more respect which does not seem to have been noticed as yet. If **sefontahund* was interpreted as **sefonta-hund* in which **sefonta* was in itself enough to represent "70", there was a danger of **sefonta hund* being misunderstood as "70 hundreds", instead of "70". On the other hand, no misunderstanding could arise if *hund* were placed at the head of the expression, since the norm was represented by *hund and seofontiȝ* = "170", or *hund and seofon and hundseofontiȝ* = "177"[42], and thus *hund-seofonta* (or *-tiȝ*) could not be understood as "170". In view of the OS facts it should also be noted that even in OE the prefixed *hund-* was not felt to be vital. As is known, "the shorter forms *seofontiȝ eahtatiȝ* etc. were used when immediately preceded by *hund* = 100"[43] — linked, of course, with *and* as can be seen from the example just quoted; the examples also show that *hund* was not banned from the singular[44].

[40] Urh. 34.

[41] Zw. 52 f., 55.

[42] See J. Wright, OE Grammar, 1950³, 235; but see Rosenfeld, Zahlen 190 B.

[43] Wright, o. c., 234 f.

[44] Sommer thus goes beyond the evidence when he speaks (Zw. 54) of the "durch die laut Befund des Gotischen, Ahd. und Ae. urgermanische Verweisung des alten einfachen Stammes für "100" in die pluralischen Hunderte (singularisch **teχuntōn χunðan*!)". I should mention here a further possibility suggested to me by my colleague M. O'C. Walshe (letter of 15. 12. 1957). He thinks that the

It would now be easy to show that the advantages that have been claimed for the periphrasis **teχuntōn χunðan*[45] are, in fact, deceptive. It will suffice, however, to state once more that there was no need to create this periphrasis; that IE **dekmd-* did not exist; that a genetival syntagma is not required by OE-OS; that the difference between *sibuntē-* and *sibunzo* is not due to a gen. pl.; finally that the inflexion of *tēhund* as a singular (in the unique *niuntēhundis*, Luke XV 7) is no evidence of an independent *-o*-stem neuter "decad" but merely due to the analogy of the independent *hund* "100".

As to the question why it is that, apart from ON, all Germanic dialects show the type in *-hund* for "70 — 90" but a different type for "20 — 60", it is not difficult to see where the answer lies. *After* the metathesis in **seftun-hund*, resulting in **seðunt^{ē}/$_{ō}$hund *ahtōt^{ē}/$_{ō}$hund* etc., the gap between the new type, characterized by the pattern "*digit* + *t* + ^{ē}/$_{ō}$*hund*", and the old type "*digit* + *(ē)hund*", was so wide that it could not be bridged. The spread of the element *-tēhund* down the scale would have led to **sehstēhund *fimftēhund* which would have had the obvious inconvenience of presenting in *sehst- fimft-* the ordinal and thus of suggesting an impossible (!) "fifth, sixth decad", while no such confusion arose with *sibuntēhund* etc., since the corresponding ordinals (**seðunþa-*, later **seðunda* etc.) were quite distinct.

Thus there was a clear dividing line between "60" and "70" which could not be crossed and effaced by adopting the transparent morphological pattern of "70 — 90 (— 100)". It is also plain that there was no reason for abandoning the well-characterized set "70 — 90", while "20 — 60" were obviously felt to be less satisfactory and were subjected to a thorough remodelling. We must now discuss the process which brought about the new state of affairs in "20 — 60".

Firmly holding to our principle that no innovation is properly explained until it is shown why the old form had become unusable and how it was disposed of, we shall start from the probable developments of the inherited IE forms.

As we have seen above, after the operation of Verner's law, the IE decads developed into the following Proto-Germanic forms:

transposition of *-hund* "could conceivably be explained from counting in tens, thus: *seðuntōhund-ahtōtōhund-niwuntōhund-tehuntōhund*, producing **hundáhtōtō- *hundníwuntō- *hundtéhuntō*, and of course **hundséðuntō*. There are probably many difficulties, but it would at least explain why the initial *hund-* is unstressed".

[45] Sommer, Zw. 54 f.

"10"	IE	**dekm̥t*	Gmc.	**tehun*
"20"		**wīkm̥tī*		**wīhund*
"30"		**trīkont-*		**þrīhund*
"40"		**kʷetwr̥kont-*		**feðurhund*
"50"		**penkʷēkont-*		**fimfēhund*
"60"		**s(w)ekskont-*		**sehsēhund.*

On the face of it, there is no reason why this Germanic set should have been in any way inefficient: the forms are clear, there is no danger of homonymy. It has been suggested recently[46] that, e. g., **þrīhund* was in "danger of confusion with 'three hundred'" but since the IE type, continued by Goth. *þrija hunda*, was inflected in both members and thus totally different from the compound **þrīhund*, the danger could not have been very real.

But the inherited set had one serious short-coming which eventually proved its undoing. In Indo-European, between 1 and 99, only the numerals 1 — 4 were inflected. This rule is completely changed in Germanic. There the numbers 5 — 12 (in OS), or even 5 — 19 (Gothic and the rest of WGmc.) became declinable, the change probably starting with the dat. where we find (Goth.) *þrim* → *fidwōrim* → *ainlibim* → *twalibim* → *fimftaihunim*. Gothic extended the inflection to the genitive, where we find *niun-ē twalib-ē*, but the nom.-acc. remained indeclinable (including *fidwōr* which had lost its original inflection in these cases). In WGmc., however, the inflection was carried through and all the cases were formed; cf. OHG *fiori* m. f., *fioriu* ntr., *fimfi* etc.[47]. The difference in the extent to which the numerals have acquired an inflexion clearly shows that the process must have started with the dative (= dat-abl-instr.) from which it was extended to the genitive and, in WGmc., to the nom-acc. A further limitation is that the use of these new declinable forms is not general. When the numeral is used adjectivally, before its noun, it is uninflected: (Goth.) *af fidwor windam* (Mk XIII 27) "from the four winds"; but when it follows its noun, or is used substantivally (independently), the inflected forms are used: *fram fidworim* "from four" (Mk II 3), *miþ þaim twalibim* "with the twelve" (sc. disciples) (Mk IV 10), *wintriwe twalibe* "of twelve years" (Luke VIII 42).

This syntactic distribution, together with the observation of the slow expansion of the inflection, paves the way to the understanding of the

[46] A. S. C. Ross, TPS 1954, 120; Rosenfeld, Zahlen 186 A.

[47] On the origin of the *-i*-stem inflexion see R. Loewe, PBB 27, 1902, 75 f.; v. Helten, IF 18, 85 f.

new expressions for "20 — 60". These decads were inherited as uninflected units, but the new syntactic rules demanded inflexion, a demand which, as is known, was satisfied by the new stem **tegu-* "decad". How did it come into being?

Some scholars maintain that **tegus* represents an IE **dekús*[48]. But this form has no foundation whatsoever in Indo-European; the Italic forms **dekuriā* sim. are no evidence for it[49]. We agree therefore with the great majority of scholars who hold that **tegu-* is a Gmc. innovation and try to explain it from the attested IE forms of "10". Here, of course, there are two opposing views. J. Schmidt assumed[50] that, like Skt. *daśa*, Gmc. **tehun* was declinable; he equated *daśábhis* with **tezum* (from IE *dekm̥-mis*). Against this it was argued that **dekm̥* was indeclinable and Brugmann proposed[51] to derive **tezu-* from IE **dekm̥t-* "decad"[52]; this in the dat. pl. gave **tezund-miz* > **tezumm* from which a stem **tezu-* was extracted. The objection[53] that the expected PGmc. form is **tezundumiz* rather than **tezundmiz* is unjustified since the IE syllabication undoubtedly demanded **de-km̥t-m-* from which a Gmc. **tezum* is the regular development[54]. Others have thought that one case was too slender a basis for the creation of the new *-u*-stem[55]. It has therefore been suggested that, beside the dat. pl., the acc. pl. could also have helped; but a form **tezun-(d)ns*[56] from which an *-u*-stem acc. pl. **tezuns* could have developed, is impossible since the only admissible form would be **tezunduns* (from *-t-n̥s*). Ross himself assumes[57] that, beside **tezum(m)-* from **tezunðm-*, there were other suitable forms resulting from the inflexion of IE **dekm̥*

[48] First, perhaps, W. Schulze, ZGLE, 1904, 545 f.; then, very persistently, Meillet in various works, for instance Caractères[3] 226 where he speaks of a Western-IE **dekus*; more recently, Pokorny, IEW 191; Krause, Hb. 176.

[49] See Ch. IV, p. 98 f.

[50] Urh. 25[3]. See also Pedersen, ANF 37, 1921, 340 f.

[51] MU V 47 f., 51.

[52] He is followed by Kieckers, Hb. 80; Prokosch, CGG 289; cf. also Sommer, Zw. 49 fn. 1.

[53] Streitberg, UG 219.

[54] B. Collinder, Festskrift till F. Jónsson, 1928, 328 f. objects to the *-t*-stem, in place of which he expects *-ti-*, but see Ch. IV, 104 f.

[55] Recently Ross, TPS 1954, 120. Against this theoretical difficulty it might be useful to point out that the single form **nefō* from IE **nepōt(s)* was sufficient to produce a new *-n*-stem inflexion as is also the case with Goth. *mena*, cf. Kieckers, Hb. 84. Equally conclusive are the *-u*-stem acc. dat. forms Goth. *auhsau* which are based on the single dat. pl. form *auhsum* from **uksn̥-mis*.

[56] Constructed by Prokosch, CGG 289.

[57] TPS 1954, 121.

as a neuter cons. stem, which would give a Gmc. ntr.-*u*-stem nom. **texu*; these two "-*u*-stem" forms led to **texu-* with a masc. and a ntr. inflexion[58].

In our view, these constructions overlook a number of important facts, esp. the primitive form underlying Gmc. **tehun* and the syntactic rule outlined above. The Gothic dat. pl. *(fimf-)taihunim* is an -*i*-stem form, ultimately based on the analogy of *þrim*. It is also clear that this form must be late, produced at a time when "10" was already **tehun*. Earlier, however, the form of the numeral was **texunþ*, from IE **dekmt* "10", and this is the basis we must start from since there was no time between Indo-European and historical Germanic at which a Gmc. **texun* from IE **dekm* (resulting in the -*u*-stem nom. **texu*) could be envisaged[59].

When the syntactic rule, discussed before, came into operation, it was of obvious importance to provide the central figure in the decimal system, the basic number "10", with suitable forms. We have seen that the need was first felt in the syncretistic dative, combining the functions of the old dat-abl-instr., and thus of high frequency[60]. The inflexion could only take form on the model of the existing consonant-stem pattern: **texunþ* thus led to **texunþmis* (perhaps also *-mos*). But, just as in Sanskrit the newly emerging inflexion of the numerals "5 — 10" adopts the movable accent of the inherited classes and we find *páñca*: *pañcábhis*: *pañcásu*, *dáśa*: *daśábhis*: *daśásu*, and even *ṣaḍbhís aṣṭābhís*[61], so in Germanic, too, the inflexion of **texunþ-* led to **texúnþmis*, or even **texunþmís*. In either case, after the operation of Verner's law and the loss of final and interconsonantal *þ* (the latter by assimilation in *-ndm-*), the forms resulted in *texun/ texum(m)s*. A second inflected form could have been the gen. pl. **texunþō^{n}*; but this would have been ill-suited for its task since it would have been homonymous with the ordinal **texunþō^{n}*. It was therefore unlikely to be kept in this form — if it existed at that time at all. For we must not forget that the inflexion first made its appearance in the dative, and in Gothic never engulfed the nom-acc., just as in Sanskrit the nom-acc. is supplied by the inherited, uninflected *páñca* . . . *dáśa*[62]. It is therefore

[58] TPS 1954, 123.

[59] See Ch. IV.

[60] Note the fact that in Tokharian (A), where the cardinals, above three, evolved inflected forms, the instrumental plural is the most frequent form; see Sieg-Siegling-Schulze, § 332.

[61] Cf. Wackernagel-Debrunner, AiGr. III 351 ff., who even regard the inflexion as IE. See also Kuryłowicz, L'accentuation des langues i-e., 1952, 29 f.

[62] Wackernagel-Debrunner, AiGr. III 351.

more likely that the genitive was based on the already existing dat.-instr. **tezum* and thus took the form **tezewō*^{n}.

The emergence of this partial inflexion also filled a gap in the use of the higher decads. The inherited **wīhund *þrīhund* etc. were indeclinable, but the new syntactic rule demanded the adoption of the inflected forms of "10". Hence **twaim tezum*[63], *þrim tezum* etc. came into being. But the process, once started, did not stop here. In the genitive, as we have suggested above, a new **tezewō* came into use. On this foundation, eventually parallel expressions of the type **twai tigjus* etc. began to be used beside **wīhund* etc., a step never taken in **tehun*.

The innovation thus slowly spread from the single form **tezum*, built on inherited principles, until a complete paradigm was formed for "20" etc. It is also certain that a singular **tezus* was never in use, for the simple reason that **tehun* was too well innervated to allow any competitor to get a foothold[64]. This divergence led to the complete exclusion of the stem **tezu-* from the singular, that is "10", which then even proceeded to adopt the new analogical form **tehunim* etc.

The new formation was carried farthest in North Germanic where it became generally the basis of "20 — 110". In the other dialects, however, the new formation was eventually stabilized for "20 — 60", but the old retained for "70 — 90". From our earlier discussion it will be clear why we should find this divide, the famous "Einschnitt" of the German scholars[65]. The division was created by the apparent change in the formation from **sehsēhund* to **seƀunt^{ē}/ₔhund*. This structural difference had the consequence that even the syntactic needs were met in a different manner from that observed in "20 — 60". In "70 — 90" the ending *-hund*, identical with the independent homonym *hund* "100", was bound to lead to the adoption of the latter's inflexion as an *-a*-stem ntr. singular noun. This is clearly shown by Gothic: *in niuntehundis (jah niune) garaihtaize* "super nonaginta (novem) iustis" (Luke XV 7). In Western Germanic, "70 — 90" lost their inflexion.

[63] This possibly also represents the dual, see Ross, TPS 1954, 118.

[64] From this discussion it will be clear that it is incorrect to ask why the nom-acc-gen. should have been built on the "formes moins usuelles du datif-instrumental" (Meillet, Caractères^{3} 226). Because of the wide variety of syntactic uses there was a great demand for a clear (i. e. inflected) dat., but in the nom-acc. (and gen.) the uninflected form was adequate for a long time.

[65] For earlier explanations, see — apart from Schmidt's Babylonian theory in Urh. — Brugmann MU V 14; Pisani, RAL 6/8, 155; Sommer, Zw. 56 f.

The new plural **tezewes* survived in most dialects in its regular form[66]. But in some areas, and under certain circumstances, it underwent certain changes. Thus OIcel. has the form *tottogo* "20" whose precise antecedent is disputed. To account for *-tog-*, it is sometimes suggested that *-o-* represents an IE weakened vowel *(*dᵉk-)*[67]. But this assumption is at variance with all we know about the numeral "10" and it seems futile to trace certain aberrant features of the individual languages to Indo-European —against the evidence of the rest, and especially that of the most archaic among them. If the Nordic forms postulate the antecedents **twō tegu, *twō tigu, *twō tugu*[68], then surely the only possible conclusion is that **twō tegu* is based on the inherited form **dek-*, while **twō tugu* is due to assimilation: *ō-e-u* > *ō-u-u*[69]. In the same way, OHG *-zog -zug* cannot justify an unsupported weakened form but must be due to assimilation: **zegu* > *zug(u)*, while *-zog* ist contaminated with *(sibun)zo* whose ending in turn acquired the final *-g* of the variant[70].

The nom-acc. of the decads "20—60" invites one further comment. We have seen that the IE formations led to PGmc. **wīχunþ *þrīχunþ *ƒeþurχunþ *ƒemƒēχunþ* and **seχskunþ* in the first place, with further changes in the subsequent periods. In the present chapter we have tacitly assumed that it was these forms that were later ousted by the new type *twai tigjus* etc. It is, however, possible, perhaps even probable, that there was no such fundamental break as is implied in this assumption. I mean that the process of rationalization may have been carried out step by step, before the final stage was reached. In other words, the continued process of rationalization may in the first place have led to **wīhund*, for instance, being reformed after **tehun* to **wī-tehund* and later to **twai tehund* etc. But this type, if it ever existed, in the end gave way to the fully inflected *twai tigjus* etc.[71].

[66] For Old Norse, see A. M. Sturtevant's detailed study, JEGP 27, 1928, 371 – 82.

[67] Streitberg, UG 219; Meillet, Caractères[3] 225; Ross, TPS 1954, 122 (with further literature).

[68] Ross, TPS 1954, 124. But cf. Gutenbrunner, Hist. Laut- u. Formenlehre des Aisl., 1951, 128: *tottogo* from acc. pl. *twan tugun*; also Rosenfeld, Zahlen 202 A.

[69] Cf. A. M. Sturtevant, JEGP 27, 1928, 377. 380.

[70] Arm. *tasn*, also frequently traced to an IE **dᵒkm̥n*, has already been explained above (Ch. I) as assimilated from **tesan(t)* < IE **dekm̥t*.

[71] For a similar "restoration" of the Slavic set, see Ch. III.

CHAPTER III

The decads in Tokharian, Aryan and Balto-Slavic

Turning now to the Eastern languages, it will be simplest to start with Tokharian. The decads (with the digits in brackets) are as follows:[1]

	A	B
"10"	*śäk*	*śak*
"20"	*wĭki (wă, we)*	*ikäṃ (wi)*
"30"	*taryāk (tre, trĭ)*	*täryāka (trai, tärya, tarya)*
"40"	*śtwarāk (śtwar)*	*ś(t)wārka (śtwer, śtwāra)*
"50"	*pñāk (päñ)*	*pśāka (piś)*
"60"	*säksäk (ṣäk)*	*ṣkaska (ṣkas)*
"70"	*ṣäptuk (ṣpät, ṣäpta-)*	*ṣuktańka (ṣukt)*
"80"	*oktuk (okät, okta-)*	*oktańka (okt)*
"90"	*nmuk (ñu)*	*ñumka (ñuńka ?) (ñu)*
"100"	*känt*	*känte.*

From the descriptive point of view there is a clear line of division between "60" and "70": note in particular the different endings in (A) *säksäk* but *säptuk oktuk*, (B) *ṣkaska* but *ṣuktańka oktańka*[2]. From the historical point of view it is clear that "60 — 70" in B continue the IE forms: **s(w)eks-kont-* > *ṣkaska*, **septm̥kont-* > *ṣuktań-ka*. There is certainly no reason to assume[3] that *ń* in "70" is from "90" where even its existence is uncertain[4]. Since, as far as can be judged, the IE sonant nasals and liquids, whether short or long, develop a vowel (A *ä*, B *ä/a*) before the nasal

[1] E. Sieg-W. Siegling-W. Schulze, Tocharische Grammatik, 1931, 194 f.; A. J. van Windekens, Morphologie comparée du Tokharien, 1944, 209 f.; Meillet, MSL 17, 1912, 281 f. — The strange forms B *ṣuktomte* "7th", *ṣuktoinka* "70", quoted by Ross, TPS 1944, 59, must be misprints.

[2] Cf. Sommer, Zw. 46 f. W. Couvreur, Hoofdzaken van de Tochaarse Klank- en Vormleer, 1947, 51, draws the line between 50 — 60, and thus finds a survival of the sexagesimal system.

[3] With Windekens, Morph. 214[4], who, on unconvincing grounds, objects to Meillet's obvious explanation (MSL 17, 291).

[4] In E. Sieg-W. Siegling, Tocharische Sprachreste, Sprache B, Heft I (1949) only *ñumka* is listed.

or liquid[5], IE *-m̥k-* regularly gives (B) *-amk-* > *aṅk-* and thus B *(ṣukt)-aṅk(a)* is in agreement with IE *(*sept)m̥k(ont-)*[6]. It is also clear that B *oktaṅka* is modified from IE **oktōkont-* after "70"[7].

"90" is more difficult. That its *m* should be due to "70 — 80"[8] is hardly credible since "70 — 80" show no trace of an *m*; nor is it any more likely that **newm̥* should have developed into **nun-* and then dissimilated to **num*[9] since a dissimilation of *n-n* to *n-m* is unparalleled[10]. It is more likely that **newn̥*, first developing into Tokh. **newen* (or **newan*), assimilated its *-n* to the preceding labial[11] resulting in **newam*, with eventual contraction to *num- (ñum-)*[12].

In A, "90" shows the same assimilation but the ending, which also appears in "70 — 80", is different from that of B: in A *-k* from IE *-kont-* is preceded by *u*. The origin of this *-u-* is not very clear. It is tempting to regard *oktuk* as the direct descendant of IE **oktōkont-*[13], but the development of an internal *-ō-* to *-u-* is somewhat doubtful. For this reason it might seem better to start from **numäk* (with the same anaptyctic *ä* as

[5] Pedersen, Tocharisch, 1949², 220; Windekens, Morph. 35 f.; Couvreur, Hoofdzaken 7. W. Winter, Language 28, 1952, 188, assumes several more developments.

[6] Sommer, Zw. 46 interprets the form as reflecting IE **septm̥*, that is as a restoration. But he is certainly right in rejecting (Zw. 47) Jacobsohn's tentative suggestion that the primitive form might have been **ṣuktant-ka* with the ordinal.

[7] Sommer, Zw. 46.

[8] Sommer, Zw. 46.

[9] This is Windekens' view, Morph. 214.

[10] I can find no example of such a dissimilation in Grammont's copious lists (Traité de phonétique, 1939²). The nearest would be a dissimilation of *n-n* to *m-n*, very feebly attested; Grammont quotes (p. 301) Pol. *Volamin* from *Volanin*, and Czech *Antomin* from *Antonin*, to which we may, perhaps, add Av. *mayna-* "naked", if from **nagna-*, and, with greater confidence, R. *mišenъ* < *nišan*, *minoga* < *Neunauge*, see Vasmer, REW II 140. 136.

[11] Examples for the assimilation of a final *-n* to a preceding labial are found in OHG *farm* (beside *farn*) "Farnkraut": OE *fearn*, Skt. *parṇa-*; OHG *piligrim* from LLat. *pelegrino*; perhaps in Umbr. *nuvime* "nonum ?" which is hardly from **novemo-*; certain in MPers. *Vahrām* from *Vahrān*, Arm. *p'andam*, Pahl. *pad(d)ām* "Mundtuch" < Av. *paiti-dāna*. Cf. also Tokh. B *mekwa* "nail", if from **noghwo-* (Krause, KZ 69, 1951, 203); and the numerous examples given by O. Grünenthal, KZ 63, 1936, 277.

[12] It is perhaps not quite impossible to trace *ñum-* to an IE **newm̥* (E. Smith, Tocharisch, 1910, 13; Meillet, MSL 17, 289; as for the IE form, Kent, Donum natalicium Schrijnen, 1929, 346), but *-n̥* is suggested by *nōnus nōnāgintā* ἐνενήκοντα.

[13] Meillet, MSL 17, 292; Pisani, RAL 6/8, 157; Sommer, Zw. 47 (the alternative, IE **oktŭ-k-*, seems to me impossible).

in "60"), from which by umlaut **numuk*, and, by syncope, *nmuk* resulted[14]. But, if Pedersen is right in concluding that final *-ō-* developed into *-u*[15], we may assume that **oktōkont-* followed the digit in changing to *oktuk* whose ending was then transferred to "70" and "90". This development of *oktuk* would be paralleled by Celtic **oxtūkont-*[16]. The replacement in A of **ṣäptank* by *ṣäptuk* because of *oktuk* is no more surprising than the undeniable change in B of **oktuka* to *oktaṅka* after *ṣuktaṅka*.

In A, as in B, "60" continues IE **s(w)ekskont-*. The same applies to "50" where IE **penkʷēkont-* developed into A *pñāk* and B *pśāka*; the palatalization is the same as in "5": A *päñ*, B *piś* (from **penkʷe*), and the decad was obviously influenced by the digit in both dialects. The *-ā-* of *pñāk* spread in A to "30 — 40", hence *śtwarāk*[17] and *taryāk*, instead of **śtwark* and **trik* from IE **kʷetwṝkont-* and **trīkont-*.

In B, it would seem that *ś(t)wārka*[18] continues the IE form without any transformation. But in that case *täryāka* would be difficult to explain. To be sure, it is usually assumed[19] that its *-ā-* reflects the prototype of Gk. τριάκοντα, but we have seen that this form is not of IE origin. We must therefore assume either that "40", remodelled after "50" from the inherited **śtwarka* to **śtwarāka*, produced **tri-ā-ka*, resulting in *täryāka* — whereupon **śtwarāka*, after *śtwāra* "4", became **śtwāraka* and eventually **śtwārka* — or that *täryāka* replaced **trīka* under the influence of the normal compositional form *täryā* — whatever the origin of the latter[20] — without being affected either by "40" or by "50".

The Tokharian forms of "20" are also rather disconcerting at first sight. B *ikäṃ* presents no difficulties, as it can continue IE **wīkn̥ti*: *i-* is from *yi-* < *wi-* while IE *-nti* developed into *-eñc* > *-än* > *-äṃ*[21]. But it

[14] Windekens, Morph. 214.

[15] Pedersen, Zur tocharischen Sprachgeschichte, 1944, 38. But in my view the argument is not cogent as long as AB *ok(ä)t*, which clearly show complete loss of *-ō*, are ignored. Nevertheless, the suggestion in the text is correct if we assume that **oktō*, passing through **oktŭ*, brought about the change to **oktŭkont* but later became *okt*.

[16] See Ch. I, p. 11.

[17] The *-ā-* of *śtwarāk* cannot be equated with that of *quadrāgintā* (Windekens 213).

[18] The Paris-texts seem to have *śwārka* only (see Meillet, MSL 17, 283), but the Berlin-texts have *śtwārka* (see Sieg-Siegling, Toch. Sprachreste, Spr. B, 45 b 4, p. 67). On the loss of *-t-*, see Windekens, Morph. 213 fn. 8.

[19] Pisani, RAL 6/8, 157; Pedersen, Tocharisch 225. 253, Zur toch. Sprachgesch. 43.

[20] It certainly replaced IE **tri-* but not under the influence of "30"; for possibilities see Windekens, Morph. 210.

[21] See Windekens, Morph. 212 f., against Pedersen's **wīkn̥t* (a neuter!), Toch. 253[1].

seems impossible to trace A *wiki* to the same primitive form. Windekens at any rate maintains that it cannot derive from **wīkn̥ti*; he starts from **wīkn̥t* which developed into **wik-* and then had the dual ending *-i* added[22]. One may, however, wonder whether "20" could have been felt as a dual, especially as although a few duals must be acknowledged, they are practically all from nouns denoting parts of the body, and certainly show that the dual is not gaining ground. But decisive is the fact that in A the dual nouns have the ending *-n̥*; the only exceptions are *āmpi* "both" and perhaps *pratri* "two brothers"[23] and these would not have been able to impose an ending *-i* on "20". If we need an analogically added ending, it is much more likely that the frequent plural ending *-i* was added to **wik*[24].

But a more plausible explanation offers if we compare the development of the 3. pl. personal ending in the verb. Strangely enough, A *-ñc* contrasts here with B *-n̥*, and it is generally assumed that A *-ñc* derives from IE *-nti* while B *-n̥* continues the secondary IE ending *-nt*[25]. This is not impossible, although it would be rather odd that the two dialects should continue different endings. But what is the reason for tracing B *-n̥* to *-nt* rather than *-nti*? It is certain that a final *-i* was dropped and the same would happen, in *-nti*, to the remaining *-t*, its only effect being to enable *-n* to survive. On the other hand, an original *-nt* (even in various combinations such as *-ment -went*) was lost completely. Finally, B *ikäm̥*, as Windekens rightly points out, demands **wīkn̥ti*, and cannot possibly derive from **wīkn̥t-* or **wīkont-*. We must therefore trace both A *-ñc* and B *-n̥* to IE *-nti*[26].

Now beside the normal A ending *-ñc* there are quite a few forms in *-e/i*: *tāke* = *tākeñc* "they will be", *ype* = *ypeñc* "they do", *träṅki* "they say" etc.[27] Pedersen suggested that the shortened forms were probably reduced before the dependent pronoun *ñi* of the 1st pers. sg.[28] But it is im-

[22] Windekens, Morph. 213.

[23] For the facts see Sieg-Siegling-Schulze, 127 f.; Pedersen, Toch. 73. In Zur toch. Sprachgesch. 10, Pedersen withdrew his objection (Toch. 70) to *pratri* as a dual.

[24] For this see SSS 110 f., Pedersen, Toch. 56 f.

[25] Pedersen, Toch. 144; Krause, KZ 69, 1951, 161, Westtocharische Grammatik I, 1952, 201.

[26] As taught by Windekens, Morph. 304; Couvreur, Hoofdzaken 56. 97. Pedersen himself acknowledged later (Zur toch. Sprachgesch. 11 f.) that the B-ending cannot be separated from the A-ending but his theory of a suffixed pronoun is unwarranted.

[27] Cf. SSS 326 f.

[28] Pedersen, Toch. 144, accepted by Windekens, Morph. 304 f.

possible to see how *-ñi* could have had such a decisive influence, esp. as the other suffixed pronouns — which did not reduce *-ñc* to *zero* — were just as frequent. It seems more likely that the difference between *-e/eñc*, *-i/iñc* is due to an incipient sound-change whereby *-ñc* was assimililated to *-ññ* and then, in polysyllables, lost; the two forms thus coexisted and usage decided for the longer, clearer forms, although the shorter forms were not eliminated altogether. In the same way, the original **wikiñc* (from IE **wīkn̥ti*) was reduced to **wikiñ* > *wiki* which, being conveniently short, but still clear and distinct, became the only form.

This explanation seems certainly preferable to any other that would use Tokharian as evidence for an otherwise unattested IE **wīkn̥t* or even **wīkont* (!). Tokharian would be of some importance in one other respect, if, that is, Pedersen were right in maintaining that IE *-ī* was preserved in both dialects[29]. In that case Tokharian would demand an IE **wīkn̥tī*. Since, however, there is no positive evidence of the survival of IE *-ī* while, on the other hand, *-ō* is certainly lost in *okt/okät*, it is more prudent to admit loss of *-ī* also. "20" can therefore in both dialects be traced to IE **wīkn̥tī*.

* * *

The Aryan languages present unsolved difficulties both in "20 — 40" and in "60 — 90". It is, however, advisable to start with the former group where the IE antecedents are fairly clear.

In the Iranian languages, with one exception to be mentioned presently, "20 — 40" are preserved in the inherited forms:

"20" Av. *vīsaiti*, Pahl. *vīst*, NPers. *bīst*, Balūčī *gīst*, Afg. *vīšt*;
"30" Av. *θrisat- (-sąs/satəm)*, Pahl. *sīh*, NPers. *sī*, Man. and Chr. Sogd. *šys*;
"40" Av. *čaθwarəsatəm*, NP. *čihil*, Chr. Sogd. *štfrs*.

"20" is quite clearly the direct descendant of IE **wīkn̥tī* and it would appear that "30" also continues an IE **trīkn̥t-*. The Avestan form of "30" is sometimes taken at its face-value, i. e. as deriving from **trǐ-*, but there is nothing to support this view and it is questionable whether Iranian would have had two forms for the same numeral[30] since MP. *sīh*, NP. *sī*

[29] Tocharisch 230: "ieur. *ī* wird in beiden Dialekten *i* ergeben haben".
[30] Cf. the four theoretically possible interpretations of *θri-* listed by Bartholomae, IF 42, 1924, 137.

certainly demand IE **trīk-*. Afg. *dērš*, Khot. *dūrsä* are also usually traced to an OIr. **θrĭsat-*[31]. But, as was shown by Bartholomae, "30" and "40" have influenced one another and, given the fact that the sonant *ṛ* in the antecedent of the historical forms (**dṛs-*) is due to "40", it may just as well have replaced an *-ī-* in **drīs-* (from **θrīs-*). It is, of course, possible that in some dialects **θrī-* was shortened before under the influence of the compositional form **θri-*. But the main point is that the data of these Eastern Iranian dialects are not of sufficient weight to warrant the assumption of an IE **trĭk-*[32]. In this connection attention should be drawn to the Parthian form *hryst*[33]. At first sight one might be tempted to trace this form to **θrīsata-* not the **θrīsat* reflected by Persian. But from an OIr. **θrīsata-* we would have a Parthian form with *-d-*, i. e. **hrīsad* just as we have *hrysd*, i. e. *hrē-sad* in "300". We must therefore conclude that Parthian *hrīst* represents an earlier **hrīs* (from **θrīsat*) which assumed the final *-t* of *wīst* "20"[34]. The important point is that Parthian, like Persian, demands a long *i* in the first syllable.

In "20", too, it is sometimes assumed that certain New Iranian dialects point to **wik-* not **wīk-*. Such a short-vowel form is posited, e. g., for Parāčī *γušt* "20", and also for *šus* "30" (*šu* "3")[35]. But the parallelism of *šī ruč* with *šu ruč* etc.[36] shows that *ī* could be shortened, probably in unaccented positions, and then coloured to *u*, and the same seems to be preferable for *γušt* from *vīsati* not *vĭsati*, just as we have Ormurī *ǰīst* from **wīsatiˀ*[37], and also Yidga *wĭst*[38], Sanglečī *wīšt*[39], Waxī *wĭst*[40].

[31] Bartholomae, l. c., p. 141 f.; Morgenstierne, An etym. vocabulary of Pashto, 1927, 22; Konow, Khotansakische Grammatik, 1941, §§ 20. 34; NTS 15, 1949, 19.24.

[32] The Zāzā-Kurdī *hīrīs* (cf. Bartholomae, l. c., p. 138) is too far removed to be taken for evidence of **trĭk-*.

[33] Cf. Andreas-Henning, Mitteliranische Manichaica III, 1934, o 47.

[34] The alternative assumption that in a form **θrīsatam* the syncope took place before the voicing of *-t-* is very unlikely, esp. as in "40" all dialects reflect **čaθwarsat* (or *-sants*), not *-satam*.

[35] Morgenstierne, Indo-Iranian Frontier Languages II, 1929, 25.

[36] Morgenstierne, o. c., 60.

[37] Morgenstierne, o. c., 329.

[38] Morgenstierne, IIFL II, 1938, 96.

[39] Morgenstierne, IIFL II 328.

[40] Morgenstierne, IIFL II 480. — Khwarezmian *'wsyc* "20" should be mentioned in this connection. Prof. Henning derived its *ū-* (or *u-* ?) from *wi-* (Zeki Velidi Togan-Festschrift, 1955, 431) and in correspondence (31. 12. 1957 and 9. 1. 1958) stated his view that while "*wi-* certainly may become Khw. *'w-*", *wī-* > *ū-* cannot be proved and even seems disproved by *wydk* "withdrawn, separate", pro-

"40" also causes some difficulties for the historian. Av. *čaθwarəsatəm*, an acc. in form but functioning as a nom., can, theoretically, be traced to IE **kʷetwr̥̄kont-*, or Aryan **čatwār-ś-* or **čatwr̥-ś-*, and even to an Iran. **čaθwar-s-*, with *-ar-* representing the antevocalic development of *r̥*[41]. The simplest would be to regard it as directly descended from the IE form, but this view, originally held by Brugmann[42], was later dropped by him because NP. *čihil*, MP. *čahihl* pointed to an OP. **čaθwr̥-θat*[43]. Although, as Bartholomae emphasized[44], this reason is not cogent, yet it would certainly be better to assume a common antecedent for the Iranian forms. But the derivation of the MP. form from OP. **čaθwr̥-θat* is not without difficulties since this should normally give **čah(w)uhl* not *čahihl*. In order to explain *-ihl*, Bartholomae is forced to resort to the unlikely assumption that *-θw-* became *-h-*, i. e. lost its *-w-*, before *r̥* developed a full vowel, and so the development was: **čaθwr̥θ- > *čahr̥h > čahihl*[45]. But, in view of the fact that *h* tends to colour an *a* to *i*[46], we can start for *čahihl* either from **čah(w)ahl* or **čah(w)uhl*, i. e. OP. **čaθwar-θ-* or **čaθwr̥-θ-*. Moreover, although it is usually assumed that *ča- > či-* was due to an assimilation induced by *-ihl*, it is just as possible, and in fact more likely, that the process started with the raising of *a* because of the preceding *č-* (cf. *jigar* "liver" from **jag- < *yak-*, and especially NP. *čihār* "4") which then affected the following *a* or *u*: **čahwahl > čihahl > čihihl*, or **čah(w)uhl > *čihuhl > čihihl*[47]. We may even say that the development of *čah-* to *čih-*

bably from **wi-ita-ka-*. If, then, the antecedent **wisati* is to be accepted — but Henning has illustrated the general disintegration of the Old Iranian phonetic system in Khwarezmian — it joins the well-known instances of Avestan-Sogdian shortening, see Henning, TPS 1942, 49 f.; Asiatica — Festschrift Weller, 1954, 291 fn. 16; Gershevitch, GMS §§ 123 f., 574 fn. 1; Szemerényi apud F. Altheim, Aus Spätantike und Christentum, 1951, 159 f. — In the present context it is of some importance to note that Khwarezmian, which, together with Sogdian, is often closely paralleled by Ossetic, shows no sign of the *-n-* of Ossetic "20" (see p. 54 f.). But in view of the Ossetic development (**wīsati > *wissati*, see the text further on), it is possible that the Khwarezmian form represents *ussič* from **wissati*, not **usič* from **wīsati*.

[41] See Bartholomae, IF 42, 138 f.

[42] MU V 30 f.

[43] Grdr.[2] I 476 fn. 1. Cf. Hübschmann, Persische Studien, 1895, § 103b; Horn, Grdr der iran. Phil. I 2, 57 (: *čaθwr̥θat*).

[44] IF 42, 139.

[45] Cf. also Mitteliranische Mundarten VI (Heidelberger SB. 15/6), 1925, 23. 57: ursprünglich *-θwrəθants* ?

[46] Horn, Grdr. der iran. Phil. I 2, 24 f.

[47] There is, incidentally, no reason for reading the MP. form as *čahihl* rather than *čihihl*.

was due to pressure from both sides, since *h* would force *a* in the same direction as *č*. In any case, there is no necessity for departing, for the sake of NPers., from **čaθwar-sat-* which also suits Avestan.

Afghan *calwēšt*, formerly thought to demand an OIr. **čaθwṛsata-*[48], is now known to be satisfied by *-sat*[49]. What is more important, even *ṛ*, posited on the strength of NP. *čihil*, is superfluous, as is shown by the parallel development of *wēštə* "hair" from OIr. **warsa-*[50]. Thus the Avestan, New Persian and Afghan forms can all derive from OIr. **čaθwar-śat*.

"40" is now also attested in Chr. Sogdian. The new Berlin-fragments, which have added a good deal to our knowledge of the Sogdian numerals[51], present the form *štfrs*[52] which derives from **čaθwarsat*.

Since IE *r̥̄* appears as *ar* in Iranian[53], the form **čaθwarsat* is the regular continuation of IE **kʷetwr̥̄k(o)nt-*. Its *-ar-* is the more remarkable as "4" usually generalizes OIr. **čaθwārah*: cp. Av. *čaθwārō*, NP. *čahār*, Afg. *calōr*, Parthian *cf'r*, Chr. Sogd. *štf'r*[54]; yet "40" is not affected by it. In spite of this massive evidence, it is not quite easy to interpret the Ossetic forms. We find for "4" Iron *cyppar*, Digor *cuppar*, and for "40" — in the language of the shepherds of the mountainous parts of the Digor country — *cuppor*[55]. But while *cyppar/cuppar* clearly continue OIr. **čaθwārah*, *cuppor* does not seem to contain the "decad" *-sat* and its *o* is not clear either. It is small comfort that "30" is *aertin*, again with a mysterious ending. For "30" one might think that *aertin* continues an earlier *θrins(at)*[56]

[48] Bartholomae, IF 42, 141; Morgenstierne, EVP 17.

[49] Morgenstierne, TPS 1948, 70.

[50] So Morgenstierne, l. c., in contrast to EVP 94, reverting to Geiger's comparison with Av. *varəsa-*; on this see also Bailey, Donum natalicium Nyberg, 1954, 3.

[51] Berliner Sogdische Texte II, ed. O. Hansen (Akademie der Wissenschaften und der Literatur 1954/15), 1955. Note, among others, that "11" is *ywnts* (not *ywts*, Gershevitch, A grammar of Manichaean Sogdian (GMS), 1954, § 1316), which seems to be the general Northern Iranian form, cf. Benveniste, JA 228, 1936, 196; "16 — 21" are *xwšrts bbts štts nwts wyst ywwyst* ("17 — 21" only in the ordinals!); "60" is *xwššty*. Cf. also Benveniste, JA 243, 1955, 319. 320 f. But *xwšrts* is not from **xšwaž-dasa*.

[52] BST II, C 2/17(2) (p. 897) Vs. 78. 80. 81 (bis); Benveniste, o. c. 319.

[53] See Bartholomae, Mittelir. Mundarten VI 1 f., 30 f., 42.

[54] BST II C 2/24 (p. 914) Vs. 1; but the ordinal is *štfrm[yq]*, C 2/5(6) (p. 867) Rs. 35, and so in Hansen's supplement *š[tf'rmyq]* in C 2/25 (p. 915) Vs. 1 the *alif* is probably unjustified.

[55] Abajev, Osetinskij jazyk i fol'klor I, 1949, 399, also borrowed into Balkar, ibid. 282.

[56] This is Abajev's view, o. c. 22. — One might also consider a purely formal levelling between **aertis* "30" and *aertinsaedzi* "60" (= 3 × 20).

but apart from the difficulty inherent in the basic form (on which presently), the final *-s* could hardly have been lost phonetically, especially as Digor has a marked preference for *-ns* in word-endings and even creates new ones by metathesis of *s* + nasal[57]. Since the expected form would be **aertis*, one might suggest that the deviation was caused by "13", *aertindaes*, whose *-n-* is due to "11" and "15", *jeuaendaes*[58] and *finddaes*; in the series "3 — 13 — 30", *aertae — aertindaes — *aertis*, the new **aertin-s* was felt to be sufficiently characterized without the final *-s*. In "40", the ending *-or* may represent *(*čaθw)ar(sat-)*, with the same development as is found in Dig. *xor* (Ir. *xur*) from OIr. *xwar-* "sun", and the loss of the final *-s* may be due to the same cause as in the case of *aertin*[59].

Iranian then, on the whole, shows no great deviations from the inherited system for "20 — 40"[60]. Indo-Aryan, on the other hand, transformed the decads, almost beyond recognition.

The Sanskrit forms, including Vedic, show a remarkable nasal element: *viṁśatí triṁśát catvāriṁśát*. This is obviously an innovation, but the extent of the innovation, and therewith its origin, is difficult to ascertain. The Prākrits agree in presenting the uniform *vīsaṁ tīsaṁ cattalīsaṁ* (or *-sa*)[61], which may all continue the *-iṁ-* of the Sanskrit forms. But Pāli has *vīsaṁ tiṁsaṁ cattārīsaṁ* (or *-sa*)[62] where "30" differs from "20" and "40". This induced Bartholomae to regard the nasal in "30", and only there, as something archaic; according to him, it is due to an Aryan innovation whereby in the inherited **trīkm̥t-*, still felt to be a compound with the ntr. pl. **trī*, the first member was reformed after **trīn*, the forerunner of the Classical *trīṇi*, and then **trīnśat*, shortened to *triṁśat*, provoked in Sanskrit and its descendants, if not in Pāli, the new *viṁśatí catvāriṁśát*[63]. He found support for the Aryan age of the innovation in the fact that Ossetic also shows the nasal in Dig. *insaej*, Ir. *(y)ssaedz*[64], from which he drew the conclusion

[57] Cf. Abajev's examples, o. c., 379, § 20.

[58] The *-n-* here is not from "15" (Miller, Die Sprache der Osseten, Grdr. der iran. Phil. I Anhang, 1903, 39), but original, cf. Av. *aēvandasa-* "11th", Parth. *'ywnds*, and now Chr. Sogd. *ywnts*, see fn. 51.

[59] Abajev, o. c., 22, derives *cuppor* from an "earlier" *cuppors*, but as far as I can see, this is not actually attested; his OIr. *catvārinsat* (sic!) is even less likely. — The WGmc. free play with *-hund* is to some extent comparable.

[60] On the Ossetic forms of "20" see the text further on.

[61] See Pischel, Grammatik der Prākrit-Sprachen, 1900, 68.

[62] Cf. W. Geiger, Pāli, 1916, 43.

[63] Bartholomae, IF 42, 134 f., and already in Studien zur idg. Sprachgeschichte I, 1890, 74.

[64] Strangely misunderstanding Miller's orthography, Bartholomae gives *ssäi* as the

that "Aryan **trīnśat* also spread to Iranian": it was the source of Prim. Ir. **wīns-* from which the Ossetic forms derive.

This would mean that Ossetic is the only Iranian dialect in which the innovated Iranian (and Aryan) formations survive; in the other dialects, for some unknown reason, the nasal was again lost, and as a result we have the forms which look as if they were the direct descendants of the IE (nasal-less) forms.

Since this remarkable construct is entirely built on the single Ossetic form, it is legitimate to ask whether the inference is justified. Before drawing such far-reaching conclusions, we must certainly consider the fact, ignored by Bartholomae, that *insaej* is not the only form in which Ossetic shows a curious nasal in contrast to all the other Iranian dialects. Bartholomae could have supported his case with a reference to Dig. *finsun*, Ir. *fyssyn* "write", which seem to derive from an OIr. **pins-*, corresponding to Skt. *piṁśa-* "carve, adorn", although the nasal infix seems to be absent in the rest of Iranian. Against this, we can point to Dig. *insun*, Ir. *(y)ssyn* "grind, whet" which derive from **wi-sā*: NP. *sān* "whetstone", Skt. *śāṇa-* "id.", *śiśāti* "whets"[65]. This example clearly shows that the *-ss-* of Iron may be resolved (by dissimilation ?) into Digor *-ns-*, as seems to happen before *-x-* also. This is suggested by Dig. *ſunx* "cooked" which, as Prof. Bailey pointed out to me[66], probably represents an earlier **ſaxwa-*[67], from OIr. **paxwa-* < **pakwa-* = Skt. *pakva-* "ripe", and thus has a secondary nasal; the present Ir. *ſycyn*, Dig. *ſicun*, reflecting OIr. **pač-* (or *paxs-*[68]), has, of course, no nasal.

In view of these facts, we must conclude that Dig. *insaej* is secondarily transformed from OIr. **wīsati*, and does not represent an OIr. **wīnsati*, unattested in any other Iranian dialect[69]. If the interpretation of the per-

Iron form, instead of Miller's *ssäj*; I follow Abajev's spelling (cf. o. c., 398), except that I use *dz*.

[65] Miller, o. c. 31; Abajev, o. c., 483.

[66] In a letter of 13. 7. 1956. Cf. also his note in TPS 1956, 118.

[67] For the *u*-umlaut **ſaxv* > **ſux*, cf. the similar development in other Iranian dialects, discussed by Bartholomae, Zum AiWb., 1906, 50; but the *u* of Buddh. Sogd. *pwyš'* and *pwγt* (Gershevitch, GMS § 551) seems to be pure labialization, due to the preceding *p*. For further material, see Bailey, BSOAS 13, 1949, 121 f., TPS 1954, 129 f. Further examples of nasalization are Ir. *fyd-ox*: Dig. *fud-onx* "misfortune", from **axva-*, see Benveniste, BSL 52, 1957, 8 – 9; Ir. *fos*: Dig. *fons* "cattle, property", must derive from **pasu*.

[68] See Gershevitch's discussion, BSOAS 17, 1955, 480.

[69] Bartholomae was unaware of Dig. *aertin*, but we cannot regard it as evidence of his Aryan **trīnśat*.

sonal name Ἰνσαζαγος as a derivative of an early Oss. **(w)insadz* is correct[70], we must, as Prof. Bailey points out, admit that the nasalization is "of some age". This does not justify, however, the assumption of an OIr., or even Aryan, **wīnsati*[71].

If the Indo-Aryan nasalization is thus not of Aryan age, let alone of IE origin, we must try to find a solution for its emergence within Indian itself. Since the inherited forms were **wīkṇti *trīkont- *kʷetwr̥̄kont-*, we would expect **vīśati *trīśaṁt *čat(w)ūrśaṁt* in the first place. It will be seen that from the point of view of Indian development, "30 — 40" presented two difficulties. First, **čatūr-* was otherwise unknown, secondly *-śaṁt* would have resulted in *-śaṁ*, thereby losing the link connecting the decads "30 — 50 (— 90 ?)" with **vīśati* and *śataṁ*, namely *-t-*. The first difficulty could have been met by shortening to **čatur-*, cf. *catur-daśa* "14". But "30", which for the speakers must have contained the ntr. pl. *trī*, seems to have suggested the introduction of the ntr. pl. *catvāri*, and, as we shall see later on, there is reason to believe that **catvāri-śaṁt* was changed to **catvārīśaṁt* after **trī-* and **vī-*.

The second difficulty, on the other hand, seems to have led to a metathesis: **trīśaṁt *catvārīśaṁt* became **trīṁśat *catvārīṁśat* from which *triṁśat catvāriṁśat* developed by shortening, and eventually *-ṁ-* was transferred to "20".

This interpretation frees us of the necessity of regarding the nasal as an obsolete case-ending (instrumental ?, or accusative ?[72]), for which there is not the slightest support. The only possible objection to our interpretation, "admissible in itself"[73], is that *pañcāśat* does not show the same transposition; the obvious answer is that in *pañcāśat* there was already a nasal in the root which prevented the adoption of **pancăṁśat* while there was

[70] See Vasmer, Die Iranier in Südrussland, 1923, 31; Abajev, o. c., 188; Harmatta, Acta Orientalia Acad. Hungaricae 1, 1950, 307; L. Zgusta, Die Personennamen griechischer Städte der nördlichen Schwarzmeerküste, 1955, 100. I must point out, however, that the comparison with *Vicentius* is hardly justified. On the other hand, one might compare Gaul. *Vocontii* if correctly derived from a **wo-kont-* "20" (see K. H. Schmidt, ZCP 26, 1957, 299), but *-kont-* for Celt. *-kant-* is strange, quite apart from the semantics; see also Vendryès, Recueil offert à M. C. Brunel II, 1955, 647, and Appendix *3*, p. 170 f.

[71] Even less can it be said that *viṁśati/insaej* "beweist Symbiose von Indern und Iraniern nördlich des Kaukasus" (Brandenstein, WZKM 52, 1953, 207).

[72] Wackernagel-Debrunner, AiGr. III 366 with earlier literature. Cf. esp. Brugmann, MU V 25.

[73] Wackernagel-Debrunner, l. c.: "die an sich zulässige Annahme". This was already considered by Bopp, Vergl. Gr.[2] II, 1859, 457.

none in "20 — 40". The alternative suggestion that *-iṁś-* is a phonetic replacement of *-īś-* in "20", whence it was transferred also to "30 — 40"[74], is ruled out by the fact that there are no examples of such a change in Vedic times, whereas the numerals are used in this form already in the Vedas.

One further possibility could be suggested by Gk. ἰκάντιν, attested by Hesychius. Since this is a blending between (*F*)ἵκατι and -κοντα[75], one might consider whether **vīśati* and *-śant* did not give rise to **vīśanti*, from which, after the consolidation of the ending, in "30" etc., in the form *-śat*, the historical *viṁśati* arose, in its turn producing *triṁśat* from **trīśat* etc. But on the whole the former explanation seems to offer a broader basis and thus to be more likely.

In view of these considerations it seems very difficult to admit that Pāli retains a more primitive distribution **vīśati — triṁśat — *catvāriśat*. It is much more probable that the nasal in "30" is due to the fact that while "2" and "4" (*dve/duve, cattāri)* have no nasal, *tiṇi* "3" has[76]. We assume therefore that *vīsaṁ* and *cattārīsaṁ* derive from **viṁśat*[77] *catvāriṁśat*, while *tiṁsaṁ*, instead of **tīsaṁ*, is due to *tiṇi* which either preserved the nasal in *triṁśat* or restored it to the regularly developed **tīsaṁ*.

"50" continues the IE form **penk^{w}ēk(o)nt* in the whole Aryan area: Skt. *pañcāśat*, Av. *pančāsat-əm* etc.[78] Ossetic (Dig.) *faendzaj* is assimilated to "60 — 80"[79]. The ending, as we have seen, is transformed from *-śant*, the nasal being lost completely.

[74] "But for the evidence of Ossetic", Wackernagel-Debrunner (l. c.) would view this possibility favourably; now also W. Wüst, Rhema 2, 1956, 38 (M).

[75] See Schwyzer, GG I 591.

[76] Pisani, Rendiconti Istituto Lombardo 85, 1952, 6 f., points out this relation between digits and decads but thinks that "20" "40" preserve forms that Sanskrit has lost. I agree with Mayrhofer (Festschrift Kirfel, 1955, 225–6) that, although for Pāli *vīsati* theoretically both **vīsati* and **vimsati* are possible, in view of the Vedic facts the latter is more probable. Cf. also Turner, BSOS 8, 1936, 205.

[77] See Turner BSOS 4, 1927, 537.

[78] Avestan spelling variations do not prove an Iranian *pančāsat-* as is strangely thought by Rosenfeld, Zahlen 181 B.

[79] That is *aexsaj aevdaj aestaj*, see Abajev, o. c., 399. Note also Chr. Sogd. *pnc's*, Buddh. *pnc'snw* (Gershevitch, GMS § 1316; Hansen, BST II C 2/17(2) Vs. 86). The Buddh. form, probably representing *pnc's*, from *pančāsat*, with the pl. (gen.) ending *-(a)nu* secondarily added (Gershevitch, o. c., § 1322), is of interest for Oss. *aertin*: is this also from **aertis-(a)nu*? This would then have developed into **aertisn*, and later into *aertin*. But the various "explanations" here suggested merely show that it is impossible to draw conclusions from modern Ossetic for Old Iranian, let alone Indo-European.

In contrast to the other IE languages, the Aryan forms of "60 — 90" appear to be derivatives in *-ti-* from the digits. Cf.

Ved.	*ṣaṣ-ṭí- sapta-tí- aśī-tí- nava-tí-*	(: *ṣaṭ saptá aṣṭā náva*)
Av.	*xšvašti- haptāiti- aštāiti- navaiti-*	(: *xšvaš hapta ašta nava*).

This synchronous relation is usually accepted as indicating the origin of the forms[80]. Thus *ṣaṣṭi-* is interpreted as an abstract-collective „Sechsheit" and the formation compared with that of Ved. *pańkti-*. But the fact is that *pańkti-* means "a set of five (pentad), series of five; group, line, row", and not "50". Since the formation of *pańkti-* cannot be explained within Indian, it is usually presumed to be inherited from Indo-European[81], and equated with ON *fimt* "pentad, a period of five days", and even with OCS *pętь*[82]. But even if an IE **penkʷti-* were established by these forms, its meaning would still only be "5", not "50"[83]. In former days the theory used to be buttressed by pointing to Ved. *ṣaṣṭi-*, allegedly employed in the sense of "hexad" at RV 7.8.14b, and to Av. *navaiti-* "set of nine". But Böthlingk proved that *ṣaṣṭi-* never meant anything else but "60"[84], and the Avestan interpretation is also without foundation[85]. How weak the explanation is becomes clear as soon as it is attempted to indicate how these formations acquired their historical meaning. Their use as decads is said to be based on elliptic phrases: "*ṣaṣṭi-* etc. were, as a rule, only used when the speakers were talking of decads, so that their use immediately evoked the notion of decad, without it being necessary for the decad to be mentioned"[86]. But the parallels quoted in support of this statement do not throw any light on the problem. That Semitic employs for the decads "30 — 90" the plurals of "3 — 9" is certainly remarkable but completely beside the point, and so is a reference to the Egyptian expression for "50 — 90" :"belonging to the digit"; for no one claims for IE *-ti-* either a pluralizing or a possessive function. To point, as an example of elliptic

[80] See Wackernagel-Debrunner, AiGr. III 369; Burrow, The Sanskrit language, 1955, 260.

[81] See Sommer, Zw. 19 fn. 1, 82, with references.

[82] See, however, Ch. IV., p. 113 f.

[83] Liebert, Das Nominalsuffix *-ti-* im Altindischen, 1949, 176, clearly shows that *-ti-* is nowhere used for anything but digits. — J. de Vries has now invented a *pańkti-* "fünfzig" (Altnord. etym. Wb. 2, 1957, 120).

[84] Sächsische Berichte 43, 1891, 254 f.; cf. Oldenberg *ad loc.*, Geldner's translation, and Wackernagel-Debrunner, AiGr. III 370.

[85] See Bartholomae, AiWb. 1044.

[86] Wackernagel-Debrunner, AiGr. III 369, accepted by Sommer, Zw. 82; Burrow, l. c.

usage, to the Latin *decies (centena milia) sestertium* is also of no avail. The only real parallel would be supplied by OHG *sibunzo* etc., if we still believed that this type derives from abstracts in *-d-*; but our discussion of the formation has shown that that explanation was without foundation.

It is clear that here again the Aryan deviation must be due to causes inherent in the set of forms inherited from Indo-European. Böthlingk had already pointed out[87] that the inherited form of "60", i. e. the juxtaposition of Skt. *ṣaṣ* and *-śat* would have caused phonetic (or euphonic) difficulties. Sommer also considered that the Aryan form, with *-kš-ś-* in the juncture, would have been "extremely inconvenient"[88]. But if the primitive form was **s(w)eks-k̂(o)nt-*, the result would have been, as is shown by Skt. *pṛccha-* = Av. *pərəsa-* from IE **pṛk̂-sk̂o-*, Skt. **ṣacchat* = Av. **xšvasat*, with no phonetic difficulty at all. There would have been, however, considerable difficulty from the morphological point of view: in Avestan the first member *(xšvaš)* would have been obscured, and to some extent this is true even of Skt. **ṣacchat*, although there the sandhi-correspondence *-t ś* = *cch*, and even *-ṭ ś* = *ṭch*[89], would have eased the position. A much greater difficulty would have been that in Sanskrit the sequence *šacchat* (before the cerebralization) would have been understood as *šat-šat*, that is the frequent āmreḍita-compound *"sēnī"*[90]. Sommer, of course, prefers to start from a primitive form in which the two components were joined by a long vowel from IE times[91]. In the resulting Skt. **šakšāšat*, Av. **(x)švaxšāsat*, the sequence of three spirants would, in his view, have been „painfully noticeable". This is possible but hardly a sufficient reason for departing from the inherited pattern. More important is that while in this case Avestan is clear, the Sanskrit form would present "6" under a form not met with elsewhere. Since, however, the assumption of an IE **s(w)eks-ē-kont-* is, in our view, unjustified, we cannot attach much importance to these difficulties.

Thus the only problem, but a very real one, was that **šacchat* could have been understood as "six each". This fact shows that it is worth examining whether the expected forms of "70 — 90" suffered from any disabilities, impairing their chances of survival. In view of the European

[87] L. c., 257.
[88] Zw. 82.
[89] Cf. Macdonell, Vedic Grammar § 80; Renou, Grammaire de la langue védique, § 125. 1.
[90] Wackernagel-Debrunner, AiGr. III 395.
[91] Zw. 82.

data, confirmed by Tokharian, we must start from IE **septm̥kont- *oktō-kont- *newm̥kont-*.

Of the Proto-Indian descendants "80" is the simplest. An IE **oktōkont-* would develop into **aśtāśant-* (later **aśtāśat* ?) which would be quite clear. If, on the other hand, the starting point was an IE **oktou-kont-*, the result would have been **aśtau-śant-* (later **aśtośat*, **aśtāśat* ?), certainly no less suited for its task.

In "70" and "90" we are faced with a difficult preliminary problem: what is the development of IE *m̥* and *m̄* in Iranian and Indian ? In Iranian both seem to have given *ā*[92] but in Indian the question has been much debated[93]. For *m̥* such correspondences as Skt. *jāta-*: Av. *zāta-*; Skt. *sāta-* : *sanitum*; *yātā* "wife of husband's brother" from **ym̥-tēr* (: Gk. Hom. εἰνατέρες, Lat. *ianitrīcēs*, OCS *jętry*), would show that it became *ā*. If so, *vāñchati* "desires, wishes" from **wm̥sketi* (: OHG *wunsc* "wish"), replaces **vācchati*, although the desiderative *vivāsati* and the PPP *-vāta-* show the expected form. For this reason Hirt[94] thinks that *ān* is the regular development before palatals, although the reason for the different treatment is hard to see.

For *m̄* there are only past participles such as *dānta-* "tame, gentle", *tānta-* "distressed", *śānta-* "appeased, calm", from *dāmyati* "be tame", *tāmyati* "faint, be distressed", *śāmyati*" be calm", in all of which of course *-ān-* may be due to the present. The contrast with *m̥* is difficult to understand[95], and there are no isolated examples. Skt. *dāsa-* "slave, foe" is certainly not from **dm̄so-*, as is proved by Iran. *daha-* "man, slave"[96] and, perhaps, by Mycenaean *do-e-ro/ra* = δοῦλος/ᾱ if from **δοhελος*[97]. Nor is *jāra-* "lover, paramour" from **gm̄ro-*[98].

[92] Bartholomae, Grdr. I 1, § 61. 2.

[93] Cf. Wackernagel, AiGr. I 14 f.; Brugmann, Grdr.[2] I 419 f.; Hirt, IG II 126 f.; Meillet, Introduction[8] 122 f.; Kuryłowicz, Études indo-européennes I, 1935, 67 f.; Burrow, Sanskrit 86 (and TPS 1949, 36); Lehmann, Proto-IE Phonology, 1952, 86 f.; Kuryłowicz, L'apophonie en indo-européen, 1956, 247 f.; Wackernagel-Debrunner, AiGr. I Nachträge, 1957, 9 ad 15, 2; 10 ad 16, 37.

[94] Hirt, IG II 126.

[95] Cf. Kuryłowicz, Études 68, Apophonie 247; Lehmann 89.

[96] See Bailey, TPS 1952, 55; cf. also Wackernagel-Debrunner, AiGr. II 2, 1954, 924.

[97] So Bailey ap. Chadwick, TPS 1954, 14; also Pisani, RhM 98, 1955, 6.

[98] See Bailey, TPS 1953, 35, but also Burrow, BSOAS 20, 1957, 140. Cf. Wackernagel-Debrunner, AiGr. II 2, 63 (with Nachtrag) where also on *dāra-* "wife" which Pisani (Miscellanea Galbiati III, 1951, 7) derives from **dm̥ro-* ~ δάμαρ, without explaining why it is a masculine (and neuter).

In this unsatisfactory state of affairs it will be best to take into account both possibilities. The Aryan development would have been:

"70" **saptāśant-* or **saptānśant-*

"90" **nawāśant-* or **nawānśant-* (before a palatal ?).

Whichever pair represents the true development, the transposition of the nasal of *-śant-* in the first case would have led to **saptānśat *nawānśat* in which the relation of the two members was completely obscured, while **saptānśant* would have given **saptānśat* anyway.

It emerges then that for various reasons the decads "60 — 70" and "90" proved unsatisfactory in the Aryan period and called for remedy. "80" and "60" pointed the way out.

For "80" Iranian has the suspiciously regular *aštāti-* while Sanskrit has the highly irregular *aśīti-*. The Skt. form shows how futile it is to operate with abstracts in *-ti-*: if this had been the formative principle, **aṣṭāti-* would be found. To explain the strange element *aśī-*, Hübschmann suggested[99] that *aśīti-* was lengthened from **aśĭti-* which represented IE **okəti-*, while **oktō* could be the enclitic form of an original **okətō*. This would mean that the suffix is *-i-* not *-ti-*, and that a residual vowel survived into Sanskrit although there is no trace of it whatsoever between *k* and *t* anywhere alse. Moreover, there is no justification for the assumption that Sanskrit alone preserves an extremely archaic formation from a root **ok-*, that is IE **okīti-*[100], when none of the other decads shows such discrepancy between digit and decad. Besides, the important question of what *-īti-* is, is simply not faced[101]. Sommer therefore rightly says that the dissimilation of the first *-t-* must be considered a "distinct possibility"[102]. His suggestion, however, that **oktə-ti-* (from which by dissimilation **okəti-* arose) is based on the nil-grade of **oktō* (from which, or rather from **oktōu*, an alternative form of the nil-grade would be **oktu-*), postulates an IE basis for something that is, as far as we can judge, a purely Indian (perhaps Aryan) deviation; it seems also doubtful whether *-ī-* in the historical Sanskrit form can be explained by lengthening between short vowels.

If we are not prepared to view the Sanskrit form as something very archaic, but adhere to the picture reconstructed from the European lan-

[99] IFA 11, 1900, 46 fn. 1.

[100] So Wackernagel-Debrunner III 370; Burrow, o. c., 261.

[101] Brugmann's interpretation of *-ī-* as a dual (Grdr.[1] 2, 480, not in Grdr.[2]) is impossible. Güntert, WS 11, 1928, 142, starts from an **aśī* "Spitzengebilde", later "eight", with suffix *-ti-* added.

[102] Zw. 82 fn. 1.

guages, we find the following. IE **oktōkont-* developed into Proto-Indian **aśtāśant-* in the first place. At a subsequent stage, the new form of "40", **catvārīśant-*, influenced "80" which then became **aśtīśant-*, thus forming the compact set **vīśati- *catvārīśant- *aśtīśant-*. When later on "20" and "40" were transformed into their historical shape, **aśtīśant-*, already different from "8", lost its first *-t-* by dissimilation[103]. The resulting paradigm **aśīśant|aśīśat-ā|aśīśat-i* etc. led to the further loss of *-śa-* by haplology: **aśī(śa)t-*. The stabilization of the ending as *-(śa)ti-* will occupy us later on[104].

In Iranian, where a transformation similar to that of Ind. **catvārīśant* never took place, there was no basis for a parallel refashioning with *-ī-*. However, the original **aśtāśati* led there, too, to dissimilation, resulting in *aštā-ti*, probably restored from **aśāti* < **aśā(śa)ti*.

In Iranian it is possible that "80" was sufficient to impose its new principle: "*digit* + *-t-*", on the surrounding decads, first on "70" and "90", later on "60". But in Indian, as is shown by the results, the development must have been slightly different. The final result, *aśīti-*, could not have brought about the historical forms. We must rather assume that at the time the haplological **aśī(śa)ti* came into fashion, "60", which in the form **šacchat*, or rather **šaś-śat(i)*, also had a high degree of sibilance, imitated the dropping of *-śa-* and eventually **šaś-(śa)ti-* emerged as the usual form; later this was reformed to *ṣaṣṭi-*, clearly after the digit **ṣaṣ*, the forerunner of *ṣaṭ*. The new pattern of "60" was then extended to "70" and in the end to "90".

The complex changes of the Indian system can be tabulated as follows:

[103] Cp. Gmc. **sebunðaz* from IE **septṃtos* and LGrm. *tachentig* "80" from *tachtentig*, Rosenfeld, Zahlen 191 A.

[104] See Chapter V. The assumption of dissimilation is, of course, nothing new. In 1876 Benfey suggested dissimilation of *aśīti-* from *aśtāti-* (Wackernagel-Debrunner III 370), and later Brugmann from *aśtīti-* (IF 5, 1895, 377, see also WP I 173), which does not explain *-ī-*. More recently Pisani assumed (RAL 6/8, 157) that the inherited IE forms **seks-ā-komtə *septom-ā-komtə* etc. were refashioned (by restoring the digits) to **saḱs-ḱati *sapta-ḱati *aḱtā-ḱati *nava-ḱati* from which by dissimilation, for euphonic reasons, *-ḱa-* was lost. But, he thought, beside **aḱtāḱati* there must have existed an **aḱīḱati* "d'indubbia originalità", though hard to explain (this is of course the crux of the matter). P. 165 he suggested that **oki-* was the Caland-form to Lat. *ocris*, a suggestion already made by Güntert, WS 11, 1928, 142.

"20"	**vīśati*	**vīśanti*	**vīnśati*			*viṁśati*
"30"	**trīśant-*	**trīśant-*	**trīnśat*			*triṁśat*
"40"	**čat(w)ūrśant-*	**catvārīśant-*	**catvārīnśat*			*catvāriṁśat*
"50"	**pančāśant-*					*pañcāśat*
"60"	**šacchat*		**šaś-śati*	**šaś-(śa)ti*	*ṣaṣ-ṭi*	*ṣaṣṭi*
"70"	**saptā(n)śant-*					*sapta-ti*
"80"	**aśtāśant-*	**aśtī-śat(i)*	**aśīśati*	**aśī-(śa)ti*		*aśīti*
"90"	**nawā(n)śant-*					*nava-ti*

* * *

The Balto-Slavic data offer little help in the reconstruction of the IE formations. As in Old Norse, the old compounds were throughout replaced by new, clearer types, based on "10". There is, however, one decad that possibly preserves traces of an earlier formation.

Except for Russian, all Slavic languages present for "90" the usual type, "nine (of) tens": OCS *devętь desętь*; Bulg. *devedesét*; Serbo-Croatian *devedèsêt*; Slovene *deve(t)deset*; Czech *devadesát*; Polish *dziewięćdziesiąt*. Russian, however, has the curious form *devjanósto*, which cannot be traced to the common pattern. On the other hand it clearly shows the influence of *sto* "100", and several attempts have been made to explain it on this basis. Endzelin has recently suggested[105] that it derived from **desę(t) do sъta* "ten (wanted) to (make) a hundred". This is logical enough but involves several unlikely phonetic changes: first the dissimilation of *d-d* to *d-n* (**desjadosta* resulting in **desjanosta*), then the further change from *desja-* to *devja-*, although this is perhaps easier to understand. We should also mention that the type *undeuiginti* is nowhere in use for decads. A similar attempt earlier by Jagić to start from *devjat' do sta* "nine to, short of, hundred"[106] fails to account for the meaning, and has the same phonetic difficulties.

If then the explanation on the basis of an internal and fairly recent innovation encounters great difficulties, it is tempting to regard the Russian numeral as a very archaic survival. Prusík was the first to link it with the IE type, tracing it to an old plural **newenə-kmtə* "nine decads"[107], which, with *ṃ* > *ъ*, gave **neveno-sъto*, **deveno-sъto*, and was transformed to *devjanosto* after *devjat'*. It will be clear from our earlier results that there is no room for an IE decad of the type **newenə-kmtə*. Objecting only to the development *ṃ* > *ъ*, Pisani tried to improve on Prusík's derivation by starting from an original ending *-kom*, i. e. *-(d)kom* from **dekom*, without the final dental; thus *devjanosto* would be based on **newenā-(d)kom* which resulted in **devjanosъ*, with *-osъ* (instead of *-asъ*), because "the speakers felt in '90' the expression **devę(tь)-n-o sъto* 'nove verso 100'" while *-to* would be from a doublet of *-kom*, i. e., *-komtə*, or from the numeral *sъto*,

[105] Endzelin, Lingua Posnaniensis 1, 1949, 3 – 4. Cf. Šerech, LUÅ 48/2, 1952, 97 fn. 1.

[106] V. Jagić, Archiv für slav. Phil. 31, 1910, 233; cf. also 4, 1880, 712, where this view was attacked.

[107] Prusík, KZ 35, 1899, 599. Cf. also Sobolevskij, Slavia 5, 1927, 451 f.; Mikkola-Dickenmann, Urslav. Gram. III, 1950, 58. — Vasmer, REW I 334, favours **newenədkmtə* "neunter Zehner", which is not only not supported by Lat. *nōnāgintā* but also fails to explain what *-ə-* in *newenə* would be (surely, it cannot be the plural: "ninth decads" ?).

which itself is contaminated from **sъ* < **k̂om* and **sętо* < **k̂mtom*[108]. But, quite apart from the unjustified first element in **newenā-(d)kom*, the assumption of a form **(d)kom* is without foundation, and the vexed problem of *sъto* is certainly not advanced to a solution by this assumption; it is also difficult to see why the speakers should have thought of „9 towards 100" as a suitable expression for „90"[109].

If it is possible at all to regard the Russian term as an archaic feature, that is, a remnant of the old decad-formation, we must start from IE **newn̥̄-kont* since **newenā-*, and especially **newenə-*, are out of the question. But, although the development of the first part is of obvious importance, it is just as important to decide the fate of the second part. Now it is generally held that a final *-ont* drops its *-t* but retains the nasal, resulting in *-ǫ*[110], the explanation being that "dans une finale comme **-ant*, la prononciation forte du groupe se maintenait même après la chute de la dentale, et **-ann(t)* donnait *-ǫ* avec le traitement de l'intérieur du mot"[111]. But the only examples for this treatment come from the verbal ending (IE) *-nt*: *-ǫ* from *-ont* and *-ę* from *-int* (?)[112], that is in a category where the correlation between primary and secondary endings *(-nti* : *-nt)* was always felt. It seems indeed that, without such influence, an original *-ont* developed in the same way as *-on (-om)*, that is gave *-ъ(n)*, and *-n̥t* gave *-ъ(n)*. If this assumption is correct, the inherited forms of the IE set of decads gave the following results in Primitive Slavic:

IE **dekm̥(t)*	PSl. **desъ(n)*
**wīkn̥tī*	**wīsinti*
**trīkont*	**trīsъ(n)*
**kʷetwr̥̄kont*	**četvīrsъ(n)*
**penkʷēkont*	**penčēsъ(n)*
**s(w)ekskont*	**še(s)sъ(n)*
**septm̥̄kont*	**se(p)tīnsъ(n)*
**oktōkont*	**ostāsъ(n)*
**newn̥̄kont*	**newīnsъ(n)* [or **devīnsъ(n)*]
**km̥tom*	**sintoⁿ*.

[108] Pisani, RAL 6/8, 155 f., overlooked by Vasmer.

[109] Pisani has quite recently (Essays for R. Jakobson, 1956, 391) abandoned this explanation of *sъto* in favour of an IE **(d)k̂u-tom* which will be discussed in Ch. IV, p. 99; cf. also p. 139 fn. 84.

[110] Vondrák, Vergleichende slavische Gramm.² I, 1924, 152; Vaillant, Grammaire comparée des langues slaves, I, 1950, 214 f.

[111] Vaillant, o. c., 217 f.

[112] The neuters in *-ę* are, of course, from *-ēn(t)*.

As we shall see later on [113], "10" was refashioned to *deseṭ* after the ordinal *deseṭъ* (or perhaps **desi(n)* to **desint* after **desintъ*), and it is possible that the following decads were also "rationalized" to **wī(d)seṭi*, **wīdeseṭi*, and eventually to *dъva deseṭi* etc. But if *devjanosto* is an archaic form, it seems that, long before any such change occurred, its forerunner had been influenced by "80" and had become **devināsъ* and, by analogy of "100", **devināsъto*. At a later stage, under the influence of *devętь*, this became **devenas(ъ)to*, and, by assimilation, *devenosto*, the first Russian form, attested 1265 A. D.[114]

The advantage of this hypothesis would be that it would provide an internal explanation for Slavic *sъto*. The assumption that *ъ* can represent IE *ṃ* is certainly out of the question[115], and borrowing of Iranian **satam* could only have resulted in **soto*[116]. But if "90" and the preceding decads ended in *-sъ*, then the original **sinto* could easily fall in line by changing to **sъ-to*, just as **devināsъ* took on the ending of "100".

That *devjanosto* owes its ending to "100" is an undeniable fact, acknowledged by all scholars who have tried to elucidate this puzzling form. I would also claim that the picture just outlined is consistent with both the IE antecedents of the decad-system and the Slavic developments, and even offers a welcome, internal solution to the much-debated problem of Slavic *sъto*. Nevertheless, the fact that there is no trace of the descendant of IE "90" anywhere outside Russian, remains disquieting and one cannot help feeling that an explanation from the form attested by all Slavic languages, that is the juxtaposition *devętь deseṭъ*, would possess a much greater intrinsic probability. Now the Early Russian continuation of this form would be **devę(t)deseṭъ*. Since the influence of *s(ъ)to* is manifest, we must assume that at this stage, or shortly after, the ending *-seṭъ* was replaced by *s(ъ)to*. The form at that time was therefore **devędesto* in which

[113] See Ch. IV, p. 111 f.

[114] The Russian form of "90" has recently been discussed by J. Šerech, Probleme der Bildung des Zahlwortes als Redeteil in den slavischen Sprachen (Lund Universitets Årsskrift 48/2), 1952, 92 f. He thinks (p. 95) that *devjanosto (devenosto)* is old as is shown by the "Stammwurzel" *deven-*, not *devęt-*, and by the compositional *-o-*. But, in my view (see the text further on), neither of these "proofs" is valid. If one still preferred an IE solution and faith could be put in the poorly attested form *devjasto* (discussed by Šerech, p. 96), this could be the direct descendant of IE **newn̥-k-*; but this would be too good to be true.

[115] Vaillant's **kṃtom* > **sъto* (o. c., 96. 136) seems to me impossible. For the bibliography, see Vasmer REW III, 1955, 15 f.

[116] Lohmann's remark (ZSPh 25, 1956, 157): "*sъto* östl. bzw. westl. Nachbarn entlehnt" is incomprehensible to me.

-e- in the penult could readily be assimilated to the final syllable, giving **devędosto*. Since these two steps are very simple, the first indeed not only simple but certain, we venture to suggest that, at this stage, of the two voiced dental stops the second was dissimilated: *deven(d)osto*; the dissimilation would be supported by morphological considerations (for the speakers) since both *devę-* and *-sto* were clear but not the function of the intervening *-d-*.

There can be little doubt that of the two types of explanation hitherto offered for the puzzling but unique Russian *devjanosto* the second has a much better chance of being nearer the truth — in spite of the general preference for the alternative assumption, taking us back to the long-distant Indo-European past[117]. If, nevertheless, our preference is correct, we have lost the last, and only, link that would have connected the Slavic system of decads with the Indo-European. In that case Slavic must be acknowledged to be of no help in the reconstruction of the IE system, just as the Baltic languages are generally admitted to have completely transformed their heritage.

[117] An IE **neweno-kmt-* is again regarded as certain by Rosenfeld (Zahlen 189); the juncture-*o* also "proves" that *-kmt* became a masculine in Slavic!

CHAPTER IV

"Ten" and the formation of the ordinals "3rd — 10th" in Indo-European

Our efforts were in the preceding chapters concentrated on establishing the Indo-European system of the decads from "20" to "90". We have found that the evidence of Aryan, Greek, Latin, Celtic, Germanic, Tokharian and Armenian permits us to reconstruct a system in which the first members of the compound numerals show a remarkable uniformity of pattern: if the digit ends in a consonant (which is the case in "6" only), the corresponding decad shows as its first member this form of the digit without any modification; if, on the other hand, the digit ends in a vowel (or sonant), the corresponding decad exhibits the digit with its final vocalic (or sonant) element lengthened; there is every reason to believe that in the single case of **oktō*, where the digit already had a long vowel, the decad showed the digit in this form.

This curious pattern in the first members will occupy us in the next chapter. Our immediate task is, however, to investigate the problems presented by the second element, problems that we have largely ignored up to now. The second member has two interesting features. First, it varies a good deal over the Indo-European territory: it appears as *-konta* in Greek, *-gintā* in Latin, as an inflected noun in *-t-* in Celtic, as *-hund* (IE *-kn̥t-* ?) in Germanic, as an unchanging stem-form *-kn̥t* in Indo-Aryan, but apparently as an inflected noun in *-kont-s/kn̥t-n̥* in Iranian. This curious state of affairs raises the important question of what type of formation these decads represent.

The second, easier question, to be dealt with in this chapter, is raised by the second element as a constitutive unit. If the IE system of decads is, as can be expected in view of the first members, a logical system, in other words, if it is based on the clear mathematical notions "two tens, three tens etc.", then the second member can be predicted to be the numeral "10", even though, perhaps, in a modified form.

This *a priori* deduction is borne out by the observable facts. The morpheme *-kont/kn̥t-*, contained in the IE decads "20 — 90", is obviously related to "10" which itself appears as **dekm̥* or *dekm̥t*. We must therefore conclude that *-kont/-kn̥t-* derive from earlier **(d)komt/(d)kn̥t*. But here we are faced with two further questions. Since "10" appears to have two

forms, we must first ask what the relation is between the form **dekm̥* (without a final dental) and **dekm̥t* (apparently having an additional *-t*). The answer to the second question: what is the element *-t-* found in the decads, will obviously depend on the answer given to the first.

It is widely assumed today that the primitive form of "10" is **dekm̥*, while **dekm̥t* represents a derivative, expressing a collective or abstract notion, which ousted **dekm̥* in some languages even from its lawful sphere as a cardinal, but is generally used as the second compositional member in "20 — 90"[1]. Others, however, have thought it preferable to assume a single form **dekm̥t* both for the cardinal "10" and for the morpheme used in the decads[2]. The former view presupposes a synchronous situation in which "ten" and "decad, a group of ten" existed side by side — comparable to French *dix* — *dizaine* — and that instead of "ten" the word "decad" was used in forming the series "20 — 90". But why should the IE speakers have resorted to this curious method? After all, even the modern Frenchman would hardly be tempted to use „*deux dizaines*" instead of the simple "*vingt*". Furthermore, if "10" was **dekm̥*, what prevented the Indo-Europeans from using this word also for "20 — 90"? To use, e. g., **penk^{w}ē(d)kom*, instead of **penk^{w}ē(d)komt*, does not seem to involve any difficulties, and it is hard to see why and how the latter expression should have been "superior" to the former.

The second view has the advantage of eliminating this dichotomy: the series "20 — 90" employs the morpheme **(d)komt* because "10" was **dekm̥t*, i. e. earlier **dekemt*/**dekomt*. The fact that "10" appears, in some areas at any rate, to derive from **dekm̥*, is easily explained on the assumption that **dekm̥* is the preconsonantal sandhi-variant of **dekm̥t*: **dekm̥t pekewes*, e. g., tended to lose its *-t*, and **dekm̥* could then be generalized, **dekm̥ oweyes*, **dekm̥ ekwōs* replacing the earlier **dekm̥t oweyes*, **dekm̥t ekwōs*, etc.

The second view also has the advantage of doing away with a mysterious formation **dekm̥-t*, a formation that does not become any more convincing

[1] See, e. g., Streitberg, IF 5, 1895, 372 f.; Brugmann, Grdr.[2] II 2, 21; Meillet, RES 5 1925, 179. 181 f.; BSL 29, 1928, 30; Lejeune, ibid. 113; Nehring, WS 12, 1929, 274; Walde-Pokorny I, 1930, 785; Walde-Hofmann I 327; Wackernagel-Debrunner, AiGr. III 360. 365. 368; Pokorny, IEW 191; Sommer, Zw. 21[1]; Jensen, ZfPhonetik 6, 1952, 50 f. 56; Porzig, Gliederung 198; Burrow, Sanskrit 260; Kuryłowicz, Apophonie 58.

[2] Benfey, Griech. Wurzellexikon 2, 1842, 213; Kögel, PBB 8, 1882, 119 f.; Hirt, IF 9, 1898, 28; IG III, 1927, 308; Schulze, KZ 45, 1912, 378; Specht, Ursprung 105.

for being often repeated. Where indeed do we find *-t-* in the postulated function? A glance at Wackernagel-Debrunners' Nominalsuffixe (p. 550) will suffice to show that, apart from Ved. *daśát* — and Class. *pañcát*, obviously formed after *daśát*[3] — *-t* is only found in the well-known function of enabling roots in *-i -u -r̥ -l̥ -m̥* to appear as second members of compounds[4]: *-stu-t-* "praising", *-kr̥-t-* "making" etc., which is very diffferent from forming abstracts or collectives. So from the point of view of formation **dekm̥t* is readily understood only if it is the original form of which **dekm̥* is a secondary modification.

The only etymon that deserves serious consideration[5] is also in accord with this view. Since in many, or rather all, decimal systems the basis of the system is the hand with its five fingers and Gmc. **χanðus* "hand" represents an IE **kont-*, it seems indeed reasonable to analyze **dekm̥t* as representing **de-km̥t* "two hands". The noun **komt-* "hand" itself may be from a root **kem/kom-*[6], formed by means of the aforementioned agent suffix *-t-*, but the important point is that the meaning "hand" is tied to the "enlarged" form **kont* which would tend to confirm that the primitive form of "10" was **de-kont-*[7].

These general considerations will, of course, hardly convince those who see nothing very much wrong in the curious dichotomy of **dekm̥* — **dekm̥t*. But decisive proof comes from the ordinal "10th".

[3] Wackernagel-Debrunner, AiGr. II 2, 160.

[4] The grammarians' *a-t* "short *a*", *ī-t* "long *ī*" etc. is obviously irrelevant.

[5] Thurneysen (KZ 26, 1883, 310 fn. 1) seems to have been the first to advance this view. Cf. also Zupitza, Die germ. Gutturale, 1896, 183; Kretschmer, Einleitung in die Gesch. der griech. Spr., 1896, 16; Hirt, IFA 8, 1897, 60; Blankenstein, IF 21, 1907, 110; Sturtevant, AJPh 48, 1927, 247 f.; Hirt, IG 3, 315; Bartoli, AGI 34, 1942, 73; Jensen, ZfPhonetik 6, 1952, 51 – 54; Rosenfeld, Zahlen 186 with fn. 23. — Pedersen's connection with δέκομαι (KZ 38, 1905, 410) cannot account for the meaning (only for "one hand"), Pisani's **de-kom* „ad finem" (RAL 6/8, 166, anticipated by C. T. Stewart, BB 30, 1906, 229. 244 – 7) neither for the meaning nor for the form. Brandenstein's suggestion (Die erste idg. Wanderung, 1936, 23 with fnn.) that: "Das Zahlwort **dekm(t)* ist deutlich zusammengesetzt aus *de* "hin . . . zu" und *km(t)* "zusammen" . . . bedeutet demnach "bis zur Kompletierung" scil. der Finger" should also be recorded. Carnoy (Muséon 59, 1946, 568 f.) derives "10" from *de* "2" with *kont-* from *kemā-* "travailler" which is basically Thurneysen's view. — Material for the five fingers or the two hands as the basis of the numerical system in many primitive languages was collected by Jacobsohn, KZ 54, 1927, 77 – 84. See also C. T. Stewart, l. c., and Verguin, Studia Linguistica 13, 1959, 62 – 66.

[6] Cf. Blankenstein, l. c.; Carnoy, l. c.

[7] Meillet's objections to "hand" (BSL 29, 36) are incomprehensible to me.

As is known, the IE ordinals "7th — 9th" are formed by simple thematization of the corresponding cardinals: **septṃ — *septṃmos, *oktō/oktōu — *oktōwos, *newṇ — *newṇnos*. Accordingly, "10th" should appear as **dekṃmos* if "10" is **dekṃ*, or, if "10" is **dekṃt*, as **dekṃt-o-s*. In point of fact both formations are attested:

1. **dekṃmos* is found in Skt. *daśamá-*, Av. *dasəma-*, Lat. *decimus*, Osc. *Dekm-anniúis* "decumaniis", OIr. *dechm-ad*, Gaul. *petrudecam-etos* "14th";

2. **dekṃtos* appears in Gk. δέκατος, Goth. *taihunda*, Lit. *dešimtas*, OPruss. *dessīmts*, Slav. *desętъ*, Tokh. A *śkänt*, B **śkante/śkañce*.

It is clear that either **dekṃmos* or **dekṃtos* must be due to innovation. Since **dekṃ* is usually regarded as the primitive form, it is natural that **dekṃtos* should be considered the innovated form[8]. But what is the basis of the innovation? Some scholars hold that **dekṃtos* derives from the "collective" **dekṃt* by the normal process of thematization[9]. This is impossible as will be seen if we try to form a Gk. *δεκάδιος, or the actually attested (late) δεκαδ-ικός: the result cannot possibly represent "10th" but only "connected with, consisting of a decad"; Skt. *dáśataya-* which is in fact usually derived either from *daśát-*[10] or *daśati-*[11], means "tenfold, consisting of ten divisions".

Another possible line of approach is to regard **dekṃtos* as derived from *dekṃ* by means of a suffix *-to-*. In that case some analogical source must be found for the introduction of *-to-* since the normal ordinal suffix would be *-o-*. A. Meillet examined the question in some detail in 1928 when he was evolving his theory of the marginal languages under the impact of the Italian school of neo-linguistics[12]. Pointing out that the type *decimus* was only found in Italo-Celtic and Indo-Iranian, i. e. the two marginal areas in the East and West, while **dekṃtos* appeared in the central languages, Meillet concluded that the marginal areas preserved an archaic feature whereas the centre innovated. The introduction of the suffix *-to-*, which played a great role in word-formation, was not, he thought, surprising, especially in areas where "10" was expressed by the collective **dekṃt*. Lejeune's study, published in the same year[13] and largely devoted

[8] Recently, Porzig, Gliederung 198.

[9] Brugmann, Grdr.[2] II 1, 163. 391; Sommer, Zw. 21 fn. 1.

[10] Sommer, Zw. 18.

[11] Wackernagel-Debrunner, AiGr. II 2, 137. 596. But since *daśati-*, attested in Class. Skt. only, is admittedly late (the old form is *daśát-*, ibid. 641), while *dáśataya-* occurs already in the RV, Sommer's view is clearly preferable.

[12] BSL 29, 29 – 37.

[13] BSL 29, 109 – 116, accepted by Moorhouse, AJPh 70, 1949, 162 f.

to the same problems, gave a more specific answer to these questions. He suggested that the source of *-to-* was to be found within the numerals, in a very archaic formation represented by IE **pn̥kʷtos* "5th", which influenced the original form of the ordinal "10th" and changed **dekmos* to **dekn̥tos*. Can either of these hypotheses account for the facts?

At first sight, Lejeune's suggestion, starting as it does from concrete facts, is more attractive than Meillets' which operates with a vague analogy of the suffix *-to-*. But in view of the important conclusions, we must carefully examine the foundations on which the assumption is based. Most IE languages present for "5th" the form **penkʷtos:* Gk. πέμπτος, Lat. *quīntus*, Osc. *Púntiis* "Quinctius", Goth. *fimfta-*, Lithu. *peñktas*, OCS *pętь*, Tokh. A *pänt*, B *piṅkte*. This type is certainly more archaic than the transparent restoration **penkʷetos* represented by Skt. *pañcathá-*[14] and Gaul. *pinpetos*, Mid. W. *pymhet*, W. *pummed*, OIr. *cóiced*. The innovation is also clear in Skt. *pañcamá-*, Pahl. *pančum*, obviously after Skt. *daśamá-*, Av. *dasəma-*; but in this case the innovation does not even reach back to the Indo-Iranian period of community[15]. Lejeune finds, however, decisive evidence in favour of an IE **pn̥kʷtos* in OHG *funfto* which, he says, is hard to explain unless its zero-grade is inherited[16].

This form of the ordinal, beside the normal *fimfto finfto*[17], was first claimed for OHG by J. Schmidt in 1885[18]. In view of the fact that none of the Old Germanic dialects, not even Gothic, the most archaic among them, shows any trace of such a supremely archaic form, this is certainly a startling discovery. What is the evidence for it? J. Schmidt pointed to the OHG form *funftin* "fifth" (dat. sg. m.) which he obtained from Graff's Althochdeutscher Sprachschatz III, 1837, 543. But a glance into Graff reveals a singular coincidence. He quotes not only the strange ordinal *funftin* but also the cardinal *funf*, ntr. pl. *funfiu* (also quoted by Schmidt), the dat. pl. *funfen*, the cardinal "50" in the form *funfzich*, side by side, to be sure, with a massive array of the normal forms *finf* etc. But the sur-

[14] Only in the Kāṭhaka, see Wackernagel-Debrunner, AiGr. III 407 f.; II 2, 720 f.

[15] See Wackernagel-Debrunner, AiGr. III 408; II 2, 753. — We should also add the "Hispano-Celtic" forms *Penti (= Pentius?), Pintia, Pintones, Pintamus*, whose *-t-* Tovar (Zephyrus 5, 1954, 19 f., Kratylos 3, 1958, 11) seems to trace to IE *kʷ*; but surely the forms represent IE **pen(kʷ)to-*.

[16] BSL 29, 111.

[17] The form *funfto* is not even mentioned in Braune-Helm, Ahd. Gr. 1950[7], 227.

[18] In an editorial note to Fierlinger's discussion of **penkʷto-/pn̥kʷto-*, Schmidt says (KZ 27, 193 fn. 1), in support of the latter form: "Auch ahd. *funftin* und darnach übertragen *funfiu* (Graff III 542 f.)".

prising fact is that *all* the forms with *-u-* come from one single author, and what is more, from that author's one single work: all are quoted from Notker's translation of the psalms! The data can now easily be ascertained with the help of the long-awaited "Notker-Wortschatz", compiled by E. H. Sehrt and W. K. Legner[19], with references to P. Piper's edition of "Die Schriften Notkers"[20]. The following list contains all the passages with *fu-*:

funf: quinque milia — *funf tiûsent* (424,7); quinque libros — *funf puoch*; quinque porticus — *funf forzicha* (429,11); quinque talenta — *funf phunt* (482,17);

funfiû (ntr. acc. pl.): quinque (talenta) superlucratus sum — *funfiû geuuan ih* (482,18);

funfen (dat. pl.): *ûzzer zênen unde fúnfen* "(the number 15 is made) of ten and five" (545,9);

funfzich "50": ducentos quinquaginta — *zuei húnt funzich* (sic! 453,26);

funftin (dat. sg. m. of "5th"): *án démo fúnftin sprózzen* "on the fifth rung" (546,2 — 3, but *finften* at I 853,20!);

funfzendin (gen. sg. m.): des *funfzêndin* gradus canticum "the song of the fifteenth degree" (546,31).

As can be seen, the ordinal "5th" occurs only once in the form *funft-*, balanced by *finft-*, attested 15 times; the cardinal occurs more often — seven times — in the form *funf*, but is again matched by *finf* attested 41 times. In view of these facts, one can only wonder how Schmidt himself could draw the conclusions he drew, and even more, how others were ready to accept his word. There can be no doubt whatsoever that *funf-* is not a highly archaic form; on the contrary. It is quite clear that *funf-*, beside the general *finf-*, indicates the labialized form *fünf*. It is paralleled in Notker by *suuúmmen, guuúnnen*, instead of *swimmen*, and beside *g(e)uuínnen*, where it is generally recognized that *u* indicates *ü*[21]. The position was admirably summed up by J. Schatz in 1927: "In *funf*, das für *fimf finf* althochdeutsch nur in NP (Notker's Psalms) Ngl (glosses to this work) belegt ist (N Nw WGen[22] haben *finf*, vom 12. Jh. an wird *fünf* allgemein), wird *ü* angenommen"[23].

[19] Halle, Niemeyer, 1955, p. 178. The form *funfiu* seems to be missing.

[20] Vols. I – III, Freiburg-Tübingen, 1883. The relevant work, the Psalms, is in vol. II 1 – 606, so the vol. number is omitted from the following quotations.

[21] Cf. Braune-Helm, Ahd. Gr.[7], § 107 A. 3.

[22] N = Alemannic Notker of S. Gallen; Nw = Vienna manuscript of Notker's Psalms; WGen = the late-Bavarian Vienna Genesis.

[23] J. Schatz, Ahd. Gr., 1927, p. 51; cf. also pp. 180 – 1.

It is perhaps not too much to hope that, in the light of the above data, the alleged "OHG" *funfto* will cease to exercise the imagination of Indo-Europeanists[24]. Old High German lends no support to an IE **pn̥kʷtos*. Even less is Modern Swabian *fuft* "5th" fitted for proving such an IE form, as was claimed by Kauffmann[25] on the grounds that "an original nasal could not have been lost". According to him, if we start from IE **penkʷe* : **pn̥kʷtos*, the resulting *fimf* : **fūhta-* could account for Swab. *fuft* by a change from **fūht-* after the final *f* of *fimf*[26]. But Kauffmann omitted to enlighten us on how the old long *ū* was shortened; it should normally appear as *əu*, only in proclitics (*uf* sim.) could it appear as *u*[27]. It is quite clear that *fuft* is based on the normal OHG *finfto* which became **funfto* and, by loss of the nasal, *fuft*. Contrary to Kauffmann's statement, Swabian is *the* Upper German dialect area in which such a loss is attested and has even been used to prove Inguaeonic connections[28]. But whatever the exact changes by which the modern forms came into being, they are certainly recent, going back to the Middle Ages at the most, definitely not to Indo-European. We might, with the same justification, try to deduce from the modern forms *fuχzē* "15" and *fuχzk* "50" an IE form **pn̥kʷ-(ēkont)*[29].

[24] The alleged OHG *funfto* is, apart from Lejeune, used by Wackernagel-Debrunner, AiGr. III 407; Hirt, UG 2, 1932, 115; Schwyzer, GGI 596 fn. 3; Sommer, Zw. 27.

[25] PBB 12, 1887, 512 fn. 1.

[26] Unfortunately, Kauffmann convinced Streitberg, UG 223. But Streitberg's note is unintelligible to me: "Von Interesse ist die schwäb. Form *fuft* 'der fünfte', deren *f* vom Ordinale bezogen sein muss, weil sonst das *n* nicht hätte schwinden können. Das Wort führt also auf eine urgerm. Form **fūhtoz* aus **fn̥htoz*". He must have meant the cardinal. Cf. also Hirt, l. c.: "Schwäb. *fuht* from *funhto*"!

[27] See Kauffmann, Geschichte der schwäbischen Mundart, 1890, 75 f.; Leo Jutz, Die alemannischen Mundarten, 1931, 97 (ibid. 145 – 6 on the forms of "5").

[28] Cf. Frings, Grundlegung einer Geschichte der deutschen Sprache, 1957³, 46 f. (on denasalization in the South of Germany), esp. 50, with Map 46. Further references in A. Bach, Geschichte der deutschen Sprache, 1956⁶, 60. 65. 80, to which add: K. Bohnenberger, Teuthonista 4, 1927, 13 f.; V. M. Žirmunskij, Nemeckaja dialektologija, Moscow 1956, 353 f.; Deutsche Philologie im Aufriß (ed. W. Stammler), I², 1957, 663, 823.

[29] According to Holthausen (KZ 72, 1955, 204) *fuchzē* is refashioned after *sechzē*. Cf. WP II 25: "der Gutt. noch (!) in schwäb. *fuchze, fuchzk*". Holthausen's view is now, fortunately, codified in Kluge-Mitzka, Etym. Wb., 1957¹⁷, 224. It is interesting to note that the facts suggested the same solution to H. Fischer, Schwäb. Wb. II, 1905 – 08, 1830 – 31, his uncertainty being only due to Streitberg.

The Germanic dialects are thus incapable of sustaining an IE **pn̥kʷtos*[30]. But before a final verdict is reached, the Aryan evidence, not mentioned by Lejeune, must be considered. A Vedic *hapax*, *pakthá-* "5th", is, with varying degrees of conviction, assumed at RV 10.61.1d, where *pakthé áhan* would mean "on the 5th day"[31]. But an inspection of the passage does not bear out the claim that "5th" or any other ordinal is indicated by the context. On the contrary, Geldner (*ad loc.*) is quite right in saying that *pakthá-* here must be identical with the man mentioned in two other passages[32]. While it is thus impossible to regard Ved. *pakthá-* "5th" as actually attested[33], a form *paṣṭha-* seems to have been established by Renou in the compounds (YV) *paṣṭhavāh-/paṣṭhauhī* "ox/cow in its fifth year", which are parallel to *dityavāh- turyavāh-* "in its second/fourth year"[34]. Renou thinks that *paṣṭha-* stands for an older *pakthá-* from IE **pn̥kʷto-* and its *-ṣṭh-*, instead of *-kth-*, is due either to the analogy of *ṣaṣṭha-* and, perhaps (?), *aṣṭama-*, or rather to dialectal differences[35]. Since the influence of *ṣaṣṭha-* is palpable[36], I can see no reason for the latter assumption, especially as the compounds under consideration seem to occur with even numbers only — apart from our word. But does this mean that **paktha-* must be admitted as the original form ? The answer is that, within Indo-Aryan, we could just as easily start from an inherited **pañkta-* (from IE **penkʷtos*), itself not attested but supported by the noun *pañkti-*, and, perhaps, even by the adj. *pāñkta-* "consisting of five parts; fivefold" which is more likely to be based on **pañkta-* than on the noun *pañkti-*[37].

[30] Brugmann's "einzelsprachliche Neuerung ist aber wahrscheinlicher" (Grdr.[2] II 2, 55) is rather timid. For the phonetic side of the changes, see v. Helten, IF 18, 1906, 98. 113 f. Pokorny, IEW 808, is correct.

[31] Wackernagel-Debrunner, AiGr. III 407; II 2, 721. 753; Renou, BSL 43, 1947, 41 with fn., and, more cautiously, Grammaire de la langue védique, 1952, 54 (: "si le sens propre est bien 'le cinquième'") and 245 (: "incertain"). Macdonell's Vedic Grammar does not list an ordinal *paktha-* (but see § 156 for the name!); it is accepted by Burrow, Sanskrit 261.

[32] See already Grassmann, Wb. zum RV, 757.

[33] It has now made its début in Pokorny, IEW 808. But see Mayrhofer, Concise Etym. Sanskrit Dictionary, II, 183.

[34] Renou, BSL 43, 38–42; Gr. Véd. 80. 245; Wackernagel-Debrunner, AiGr. II 2, 721.

[35] See on this also Gr. Véd. 54.

[36] I am in agreement with Debrunner who also thinks (Kratylos 1, 1956, 42) that phonetic development of *paṣṭha-* from **pn̥kt(h)o-* is "höchst unwahrscheinlich, mag nun v. *pakthá-* die Bedeutung 'der 5te' haben oder nicht" and that only the analogy of *ṣaṣṭha-* can be seriously considered. Cf. also Wackernagel-Debrunner, AiGr. I, Nachträge, 1957, p. 98 ad 180, 25.

[37] This is suggested by Wackernagel-Debrunner, AiGr. II 2, 130. But cf. (ibid.) *ṣāṣṭha-* "1/6", *āṣṭama-* "1/8", based on *ṣaṣṭha- aṣṭama-*.

Evidence of a somewhat more positive character comes from Iranian. The ordinal "5th" appears in Avestan as *puxδa-* which is often traced to Iran. **paxta-*, IE **pn̥kʷto-*, its *-u-* being variously explained[38]. This form contrasts strangely with the noun *pantanhum* "a fifth", i. e. *pantahva-*, which is traced to **pan(x)tahva-*, from an ordinal **pan(x)ta-* "5th"[39]. That **paxta-* and **panxta-* should have existed side by side in Old Iranian, is extremely unlikely; even less probable is the assumption that, although, as shown by the Avesta, **paxta-* was early generalized, **panxta-* should yet have survived long enough to serve as a basis for the noun **pan(x)tahva-*. But, perhaps, the contradiction is not so difficult to resolve. The nouns in *-hva-* are not, as a rule, based on the ordinal, but on the cardinal, as will be seen from *θri-šva-* "a third (part)", *čaθru-šva-* "a fourth, a quarter"[40] and the very late *haptahva-* "a seventh", *aštahva-* "an eighth". These forms rule out the possibility of "a fifth" being based on the ordinal. We must obviously assume that under the influence of *haptahva- aštahva-* the analogical *pan(č)-ta-hva-* was formed, perhaps preceded by an analogous **xšvaš-tahva-*. It certainly seems inadmissible to seek for an unsupported ordinal **pan(x)ta-* in this late noun only.

[38] Cf. Bartholomae, IF 1, 1891, 492; Grdr. I 113 (**puxta-* after **turtha-* "4th"); Meillet, MSL 9, 1896, 379 (*-u-* misreading for *-q-*, a view shared by J. Hertel, Sächs. Ber. 87/1, 1935, 58 – 60).

[39] Bartholomae, AiWb. 844.

[40] OIran. **θrišva-* is attested also for OPers. by the Elamite inscriptions of the Persepolis Treasury, but not **čaθrušva-*, see Szemerényi, ZDMG 101, 1951, 199. I must emphasize this because Cameron, overlooking this paper, has recently repeated his view (JNES 17, 1958, 175). Yet, the fact is that an OP. **čaš̀ušva-* could not appear in the sort of Elamite disguise which occurs in these tablets with the value of $^1/_4$th, nor could OP. **čaš̀ušva-* be reduced to **čašva-* (or *čaš̀va-* ?), not even in Elamite. The only OP. form that the Elamite spellings can represent, is *čaš̀uma-*, MPers. *tasom*, see Szemerényi, l. c. However, we must be grateful to Cameron for producing new evidence of OP. "a fifth" and "a tenth". Elam. *da-sa-maš* is, as he says, OP. *dasama-* (where *-s-*, in contrast to TurfanMPers. *dah-om*, should be noted), but *pan-su-ma-iš* cannot be **pančuva-*, a form which has an impossible suffix and an impossible vowel (or, worse still, lack of vowel) after *č*; the same applies to the interpretation of Elam. *pan-su-kaš* "shekel" supposed to represent **pančuka-*. (A different explanation of the earlier known *pasuka-* was given by Harmatta, Acta Linguistica Acad. Hungar. 4, 1955, 301 – 8). It is to be hoped that **pančuva-* was not meant to represent **pančva-* from *pančušva-* (whereas the form should have been **pančahva-*). Elam. *pan-su-ma-iš* quite clearly reflects OP. *pančama-*, in accord with *aštama-navama-dasama*, and as such is a welcome addition to our meagre evidence of OPers. ordinals. Elam. *aš-du-maš*, *nu-ma-u-maš* cannot reflect *-ahva-* as is assumed by K. Hoffmann (Handbuch der Orientalistik, IV/I, 1958, 18).

On the other hand, an OIran. **paxta-* seems to be supported by Parāčī *patū-rūč* "fifth day (from today)", if this is really descended from OIr. **paxta-ka-*[41]. This primitive form presents the easiest explanation of Av. *puxδa-* whose *-u-* may be a rare, but simple, case of labialization, common in the later Iranian dialects. Even so, it remains uncertain whether we are entitled to reconstruct an IE **pn̥kʷto-*. We cannot dismiss the possibility that later Iranian, even Av., **paxta-*, is from an OIr. **panxta-* in which the nasal was lost in the group *-nxt-*, a fairly common phenomenon in later Iranian[42].

An archaic **pn̥kʷto-* is thus nowhere attested reliably[43]. But even if it had existed at an early stage, and was later replaced by **penkʷtos*, the problem would still remain: where does the suffix *-to-* in **pn̥kʷto-* (or the attested *penkʷtos*) come from? This question was not answered, not even put, by Lejeune, who merely assumed that the nil-grade of the root would warrant the antiquity of the suffix. But the strangeness of the suffix becomes even clearer if we examine the ordinal formation of Indo-European which as yet cannot be said to have received a satisfactory explanation.

* * *

The composite picture presented by the Indo-European languages shows for the set "3rd — 10th" a number of formations which at first sight seem to defy every attempt of reducing them to some basic pattern. That "first" and "second" are "outside the pale", is a phenomenon not confined to Indo-European; Lejeune has marshalled an impressive array of evidence from other linguistic groups, showing that this is practically

[41] See Morgenstierne, IIFL III 3, 1956, 230.

[42] See, e. g., the Sogdian instances listed by Gershevitch, GMS, p. 51. Bartholomae held that Av. *panta-*, from Aryan **pankta-*, lost its *-k-* in Aryan times (Grdr. I 11), but in view of the exceptions the rule is hardly tenable. Note also Khotanese *pūha-* "fifth". Its *-ū-* is not from Iran. *-u-* but due to colouring by the preceding labial; cf. *puspare* from *paṃjsa pare* "fünf über", *muhu* "we" from *māhu* (Konow, Khotansakische Gramm., 1941, § 25. 18). Its *-h-* possibly represents an earlier *-θ-* from *-χt-*, with transfer of the aspiration, cf. *pamuha-* "garment" from *-muχta-* (not *-θ-*, Konow, § 18). Thus *pūha-* continues **panxta-* or **paxta-*; it certainly cannot prove **paxθa-* or **puxθa-*.

[43] On the new Hispano-Celtic forms see fn. 15. Hierogl. Hit. *paⁿta*, interpreted by Bossert as "five" (Archív Orientální 18, 1950, 123 – 5, but contested by Friedrich, ibid. 21, 1953, 138[6], Meriggi, Athenaeum 29, 1951, 44, and E. R. Oney, JCuneiform Studies 5, 1951, 62 – 3) would cause difficulties with its *-t-* but does not affect our problem; see also Palmer, TPS 1958, 59[2].

universal[44]. But even within the set "3rd—10th" it is only in "7th — 9th" that the simple principle of thematization can be clearly seen in most IE languages. The formation is, as we have seen, disputed in the case of "10th" while in "3rd — 6th" we find several types with the suffixes *-yo- -to- -ro- -mo-*.

In spite of this variety of formative procedures, we may state from the outset that 1. if the IE ordinal formation "made sense" at all, i. e. was based on a simple principle, then the state of affairs found in the individual languages and presented as Indo-European in our handbooks must in fact be due to secondary alterations; 2. of all the formative procedures found in the various IE languages it is only the simple means of thematization that does "make sense". It finds an illuminating parallel in the Romance languages where a similar type of ordinal formation by adding the article to the cardinal is well-known[45].

Both statements are borne out by an evaluation of our data more methodical than has so far been the common practice. To begin with, the sphere of simple thematization was shown to be more extensive by the discovery in our century of an archaic form of "6th" in Celtic. For this ordinal the following formations had been known earlier:

**s(w)ekstos*: Skt. *ṣaṣṭha-*[46]; Lat. *sextus (Sestius)*; OIrish *sessed*, Welsh *chweched* (both from **sweks-etos*); Goth. *saihsta*; Lithu. *šeštas*, OCS *šesto*;

**s(w)ektos:* Gk. ἕκτος[47]; OHG *sehto*, ON *sétte*; Venetic *Sext-io*[48].

[44] BSL 29, 117 f. Cf. Nehring, WS 12, 1929, 286.

[45] Cf. Brugmann, Grdr.[2] II 2, 50, and, for a more general survey, Benveniste, Noms d'agent, 1948, 145 f.

[46] For Av. *xštva-* "6th", beside *xšvaš* "6", Bartholomae assumed (Grdr. I 113) that the original **šaštha-* was, under the influence of the coexistent **(ča)turtha-* "4th", reduced to **štha-* and then, on the analogy of the alternation **šaš*: *šwaš*, changed to **štwa-*. It seems to me much simpler to start from **xšvašta-*, the normal Iranian ordinal to *xšvaš* which by metathesis became **xšaštva-* and then, to avoid the repetition of two syllables beginning in *š*, *x(ša)štva-*.

[47] But we cannot rule out the possibility that this is a Greek development from **ἑκ(σ)τος*.

[48] Venetic can only be used if, as is likely (but note E. Polomé, Gedenkschrift P. Kretschmer, II, 1958, 86[4]), the name *se.x.tio*, on a vase from Cadore (Callegari, Notizie degli Scavi 1933, 125, no. 10; Pellegrini, RAL 8/8, 1954, 515), is connected with our numeral. However, it does not represent **seχ(s)tio(s)* (Whatmough, CP 29, 1934, 288, accepted by Lejeune, RPh 25, 1951, 219 fn. 76; REL 31, 1954, 121; REA 56, 1954, 80) but *seχtios*,with spirantization of the original *k* in the cluster *-kt-*. Without wishing to discuss here the controversial interpretation of

The second type is more archaic than the first. It is based on an IE elision of the spirant in the group *-kst-*[49], while the historical *-kst-* is an obvious restoration, possible at any time, after the cardinal. But neither type represents the original formation as was shown by the appearance of Gaulish *suexos* at La Graufesenque. It was Meillet's merit to point out that the unexpected form was not a misspelling or an abbreviation[50], but an archaism[51], preserving the primitive IE formation with only a slight modification inasmuch as the original **suksos*, formed with *-o-* from the nil-grade of **sweks*, was brought into line with the cardinal.

The assumption of the nil-grade in the ordinal is based on the Baltic evidence. According to Meillet, OPruss. *uschts* "sixth", together with Lithu. *ušės* "les six semaines de couches", is based on **ukso-*. These forms are remarkable not only on account of their nil-grade but also because of the absence of the initial *s-*. This curious feature recurs in Arm. *veç* "6" which cannot derive from **sweks* or **seks* (which would have given *k'eç* and *heç* respectively) but points to an IE **weks*, in spite of the fact that initial *w-* normally gives Arm. *g-*[52]. This means that beside the widely attested **s(w)eks* we must assume an IE **weks*, with the corresponding ordinal **uks-o-*, replaced by **uks-to-* in Old Prussian[53]. If this is true, we must conclude that the primitive form of "6" was **weks*, and the widespread **sweks* has a secondary *s-*, obviously from the following numeral **septm̥*[54], cf. such well-known examples as Goth. *fidwor* from *fimf*, Slav

Venetic *χ*, I would point out that Ven. *vhaxsθo*, from **fak-*, must represent *[faχsto]* and not *[fagsto]*. If Ven. **sexto-* is correctly interpreted as reflecting IE **sektos*, we have here an important Venetic-Germanic isogloss. — We should also note the Hispano-Celtic forms *Sesmaca* from **seks-mo-*, and *Suessatio* from **sweks-* (Tovar, Zephyrus, 5, 1954, 18; Kratylos 3, 1958, 8).

[49] Osthoff, MU 4, 329 f.; Brugmann, Grdr.[2] II 2, 55.

[50] Vendryès, BSL 25, 1925, 37; Thurneysen, ZCP 16, 1927, 300, and again in GOI 250.

[51] Meillet, BSL 29, 33; accepted by Weisgerber, Sprache der Festlandkelten, 1931, 190; Schwyzer, GG I 596[3].

[52] But the same "anomaly" is also found in *vařim* "I burn", see Meillet, Esq.[2] 49. Pisani's **useks* as the starting point for the Armenian form (KZ 68, 1944, 175; Ric Ling 2, 1951, 59) is hardly credible.

[53] Fierlinger seems to have been the first to postulate (KZ 27, 1885, 196[1]) *w-* not *sw-* for Armenian, and **wktho-* for OPruss. *uschta-*. Vaillant (BSL 44/2, 1948, 129) would start from IE **ksweks* (in Av. *xšvaš* ?), with ordinal **ksuks-to-*, but the dissimilation of the latter to **uksto-* is unacceptable. For the Aryan forms see A. S. C. Ross, TPS 1944, 57.

[54] I reached this result in 1951 and was glad to see that Kent reached the same conclusion in AJPh 72, 1951, 80. See also the next fn. on Nehring.

devętь from *desętь*, Heraclean ηοκτώ from ἑπτά (and Elean ὀπτώ from ἑπτά)[55].

To return to Gaul. *suexos*. Its importance, in the present context, lies in the fact that the sphere of thematization as the morpheme of ordinals is now extended to cover the set "6 — 9".

On the other side of "5", "4th" shows several types of varying antiquity. The most recent is IE **k^{w}etwŗtos* in Lithu. *ketvirtas*, OPruss. *kettwirts*, OCS *četvrъtъ*, Hom. τέτ(ρ̄)ρατος[56], Tokh. A *śtärt*, B *śtart(t)e*[57], clearly formed with the suffix *-to-* from the current stem-form **k^{w}etwŗ-*. Late variants of this type are also represented by Skt. (not RV) *caturthá-*, "clearly analogical to antevocalic *catur-*"[58]; Latvian *ceturtais*, influenced by earlier **cetur-* = Lithu. *ketur-* (Modern Latvian *četri* is due to Slav influence)[59]; Lat. *quārtus* from **kwa(t)wortos* based on the cardinal *quattuor*[60]. The same applies to Gk. Τυρταῖος (and Τύρταμος ?), if based on *(τε)τυρτος with the same reduction as is seen in Delph. ταρταμόριον, Koine ταρτημόριον, none of which derives from an archaic IE **(k^{w})turtos*(k^{w})twŗtos*[61].

That these formations are all recent, is shown by their close agreement with the cardinal and by the use of the suffix *-to-*. It is certainly erroneous

[55] If the original form was **weks*, the oft repeated connection of the IE numeral with the Semitic (Assyr. *šiššu*, Hebr. *šēš*, Arab. *sittu*^{n}), weak in itself because the primitive Sem. form had a dental (Ass. *šidšu* etc., cf. Sommer, Zw. 60), becomes altogether untenable. The PIE form could be based on **(H)weks-* "to grow" (Gk. ἀέξω), so that "6" would be "the increase" after the first "hand". The latter suggestion, as Prof. O. Skutsch kindly informs me, was also advanced by A. Nehring in a course given in the Wintersemester 1928/9. Merlingen's extravagant assumptions (Sprache 4, 1958, 50) are not helpful.

[56] Not original **k^{w}etŗtos* (Lejeune, Traité de phon. grecque, 1955^{2}, 72 (71 fn. 7)).

[57] Not from **k^{w}twŗto-*, Couvreur, Hoofdzaken 7, 12.

[58] Edgerton, Language 19, 1943, 97 fn. 36.

[59] Endzelīns, Latviešu valodas gramatika, 1951, 498. 488; Senn, ap. Edgerton, l. c.

[60] Szemerényi, Glotta 35, 1956, 101, and not as Brugmann, IF 28, 1911, 370 fn. 3.

[61] See Schwyzer, GG I 596^{2}, against Lejeune, l. c. 111. The form **k^{w}eturtos* goes back, of course, to the time when the paradigm of "4" still had the grade **k^{w}etur(ŗs)*, cf. Aeol. πίσυρες etc. An IE **k^{w}tru-* is, from the point of view of IE syllabication, impossible, only **k^{w}tur-V-* and **k^{w}tuwŗ-C-* being admissible (see Edgerton, Language 19, 1943, 108 f.: types **ktiwa-* and **ktiyut*). Hence the usual derivation of τρυφάλεια τράπεζα, Osc. *trutom* (whose meaning is quite uncertain, but note Untermann, Kratylos 1, 1956, 65: "zweiter Tag" or rather "Gerichtstag", not "fourth") must be given up. — As to τεταρ- > ταρ-: cp. NPers. *dīgar* "2nd" from *didīgar*, early **dwitīya-k-* (Bartholomae, ZAiWb. 63 fn., 258). Pisani (Paideia 14, 1959, 171) assumes **k^{w}t-ŗ-*, nil-grade of **k^{w}et-ŗ-*, to explain τράπεζα and *turīya-*, but the primitive form fails to account for the *u* of the latter and is unjustified by the IE data.

to posit an ordinal **k^{w}etwr̥tos* or **k^{w}twr̥tos* for Indo-European[62]. A much more archaic formation, which must be acknowledged for Late IE, is attested by Aryan, where we have Ved. *turíya-*, Class. Skt. *túrya-*, and Av. *tūirya-*, deriving from an earlier **turĭyo-*. This form has recently obtained unexpected corroboration from Hittite. F. Sommer has shown in an important paper[63] that ^{LÚ}*duyanalli-*, the title of a palace-official (parallel to *tariyanalli-*), is based on the ordinal **tuyana-* which in turn is enlarged from **tu(r)ya-* "fourth"[64]. Thus the existence of an IE **tur(i)yo-* "fourth" is firmly established[65].

IE **tur(i)yo-* shows two remarkable features. First, it has a suffix *-(i)yo-* proving that *-t(h)o-* was not *the* IE suffix of this ordinal; its origin will be discussed presently. Secondly, since "fourth" must be based on "four", **tur(i)yo-* seems to stand for **k^{w}tur-iyo-*, where the basic **k^{w}etwer-* has been weakened in both syllables. Now Av. *āxtūirīm* "four times" (cf.

[62] As is done by Brugmann, Grdr.^{2} II 2, 54; Wackernagel-Debrunner, AiGr. III 407 (: *caturthá-* "Erbform"!).

[63] IF 59, 1948, 205 – 7.

[64] Cf. Friedrich, Hethitisches Wb. 227. Kronasser's "Zusammenhang ganz zweifelhaft" (Handbuch 151) will come as a surprise to everyone who has read Sommer's meticulous argument. Even stranger is the innuendo (p. 251) that Sommer's "failure" to mention the word in Zw. means that he no longer holds his earlier view. It is rather surprising to find that Güterbock also attacks Sommer's brilliant interpretation. He thinks (RHA 60, 1957, 1 – 3) that CH has *meuwa* "4" (cf. Luwi *mauwa*) and so *duya-* from a different stem is unlikely. He suggests that *duy-an-alli* (cp. *triy-an-alli*) is from the fem-ntr. *dui*, "man of the second rank". But, quite apart from whether a formation from the fem-ntr. *dui* is possible, I fail to understand how the text can be interpreted in this manner. The text (IBoT I 36, Vs. I 36 f.) has: *nuši tezzi* ^{DUG}*kaltiyawa kattan paimi apāša parā dametani (!)* (37) ^{LÚ}*MEŠEDI tezzi apāša parā* ^{LÚ}*tarriyanalli tezzi* (38) ^{LÚ}*tarriyanallišma* ^{LÚ}*duyanalli tezzi* (39) ^{LÚ}*duyanallišma* . . . In other words, the man tells someone (that he must go out), this person tells a second person — he to the *tariyanali-* and this to the *duyanali-*. Whether the last two are ranks, is not at all certain, but the sequence second-third-fourth is, to my mind at any rate. Sommer's view is also followed by V. V. Ivanov, Voprosy slavjanskogo jazykoznanija, vyp. 2, 1957, 6. 8[4].

[65] A welcome addition is Gaul. **petuarios* if this expansion of the abbreviated form *petuar* at La Graufesenque can be regarded as certain (cf. Meillet, BSL 29, 34). The suffix is in any case shown by Welsh *pedwerydd* (MW. *pedwyryd*) from **k^{w}etwar(i)yo-* where *-iyo-* must continue the suffix-form of the old **turiyo-*, although the stem has been rejuvenated, since there is no other possible source for *-ydd:* the only other ordinal that has this ending, W. *trydydd*, could only be interpreted as *try-dydd* and would therefore have produced **pedwer-dydd*, or even **pedwer-ydydd*. The Celtic evidence for an IE **k^{w}twerto-* (Pedersen, Donum natal. Schrijnen, 1929, 425) is quite unreliable.

āθritīm "three times; the third time") seems to preserve a primitive **xturiya-*, which would still reflect the initial k^w of IE **k^wturiyo-*[66]. Hittite, on the other hand, would probably have *kutur-* from an inherited **k^wtur-*[67] and thus points to IE **(k^w)tur-*. But this conflicting evidence can be reconciled if we consider that Avestan is hardly likely to preserve a more archaic form than either Vedic or Hittite; in other words, it can be suggested that *āxtūirīm* (occurring twice only, in late texts)[68] is a misreading for *ātūirīm*, due to the fact that the double-alif, indicating the length of the first vowel (*"twrym = āturiyam*), was interpreted as *āx-*.

Turning now to the suffix of **tur(i)yo-*, it would seem that we have to acknowledge *-yo-* as an ordinal morpheme. This conclusion would, however, again blur the pattern found in "6th — 9th", and we are justified in asking whether a primitive **(k^w)tur-o-*, the most archaic form of "4th", was not exposed to some analogical influence which can account for its subsequent change to **(k^w)tur-iyo-*. Since the source of analogy can only be sought in "5th" — which obviously does not fit the requirements — or "3rd", we must examine the formations found with the latter term.

Most IE languages use the suffix-combination *-tĭyo-* to express "third": Skt. *tṛtíya-*, Av. *θritya-* (= *θritĭya-*), OP. *šitĭya-*, Lat. *tertius*, Umbr. *tertio*, W. *trydydd* (from *tritiyos*), Goth. (etc.) *þridja*; Lithu. *trẽčias* (from *-ty-*), OCS *tretьjь*, OPruss. *tīrts* (acc. *tīrtian tirtien*).

A strange intrusion into this compact system can be seen in OIrish *triss* which derives from **tri-sto-* and corresponds to Lat. *testis*, Osc. *trstus* "testes" ("third standing by"), Ved. *tri-ṣṭha-*. But the use of this word as the ordinal is clearly a late innovation since the earlier **tritiyos* is well-attested in British (W. *trydydd*, Bret. *trede*).

Another innovating area is Greek, where τρίτος is obviously formed after τέταρτος πέμπτος ἕκτος[69]. Tokh. A *trit*, B *trite* are due to a similar process, cf. A *štärt*, B *štarte* "4th"[70]. OPruss. *tīrts*, as is shown by the acc. *tīrtian*, stands for *tīrt(i)s* from *-tiyos*.

While the suffix is thus almost universally shown to be *-tĭyo-*, the

[66] See for the form Bartholomae, Grdr. I 33; AiWb. 310; Duchesne-Guillemin, Les composés de l'Avesta, 1936, 196.

[67] See Kronasser, Handbuch 251.

[68] At V. 10. 11, and Y. 9. 14.

[69] Brugmann's view: „Die altertümlichste Bildung scheint gr. τρίτος zu sein" (Grdr.[2] II 2, 54) is out of the question, see Wackernagel-Debrunner, AiGr. III 406.

[70] Also Illyr. *trita-*, Alban. *tritë*, see Mayer, KZ 66, 1939, 106 f.; Krahe, Die Sprache der Illyrier I, 1955, 61.

root itself appears in the variants *tri-* *tre-* and *tr̥-*. Of these, *tri-* can easily be understood as due to the cardinal-form, while *tre-* and *tr̥-*, being more difficult to explain, could be regarded as more archaic. But to conclude that *-r̥-* alone proves that Ved. *tr̥tīya-* is "*the* form of the parent-language"[71] is hardly justified in itself and is not proved by OPruss. *tīrts*. The latter must certainly be dismissed as evidence of an IE **tr̥t-* since it is clearly due to the influence of *kettwirts* "4th"[72]. But even the Vedic form has been questioned by Scheftelowitz[73] who admits only *tritīya-* in the RV.

Others have been more impressed by the forms in *tre-*. Thus Schulze was led to posit as the original form of "3" an IE **tre-*, which would still appear in **tretos*/**tr̥tos*, but was later enlarged with the pluralizing *-i-* to **trei-*, from which was formed the new **tri-tos*[74]. But this hypothesis fails to answer two questions. First, is it proved, or even probable, that ordinals were formed at a time when "3" still had the primeval form **tre-* — if such a form ever existed? Secondly, since *-to-* is quite clearly a late ordinal suffix, is it likely that it was part of the earliest form of "3rd"?

The answer to the latter question can be given on the basis of the results reached so far. Since the only well-established ordinal-suffix, attaching itself to the weak form of the cardinal, is *-o-*, beside which there is the solitary *-(i)yo-* in **kʷtur-iyo-*, we are forced to conclude that **trei-* formed the ordinal **tri-o-*, that is **tri-yo-*. It will be seen at once that the two notations describe the same reality: **tri* + *o-* can only be articulated as **triyo-*. This *a priori* result, based on the internal evidence of the IE languages, can now be confirmed *a posteriori*, Hittite again supplying the missing link. Already in 1932, Sommer drew attention to the strange

[71] Wackernagel-Debrunner, AiGr. III 406 (also II 2, 644 f.). There is not even an "uncertain trace of *tr̥t-*" in Sogdian (as stated by Wackernagel-Debrunner, II 2, 645, after Meillet) since the form *štiy-* demands *θritiy-* with a consonantal *r*, and *'tδrty* is merely a spelling, see Gershevitch, GMS 200 f.

[72] As was suggested by Brugmann, Grdr.[2] II 2, 12 — in spite of Saussure, MSL 8, 1894, 439; Fränkel, Die baltischen Sprachen, 1950, 30 f. (who regards it as an OPruss.-Skt. isogloss!); and Endzelin, Altpreussische Grammatik, 1944, 109, who strangely assumes that *tirtis* can (!) be compared with *tr̥tīyaḥ* but *tīrts* is probably due to levelling with *kettwirts*, as if the latter's power had been exhausted by the change of *tirtis* to *tirts*. Note also Alsatian *dirte* for *drite* (K. Weinhold, Alemannische Grammatik, 1863, 309) and Dutch *derde*, Engl. *third*.

[73] KZ 53, 1925, 263 f.

[74] Schulze, ap. Lohmann, ZSPh 10, 1933, 365[1], accepted by Specht, Ursprung 105, and expanded into an imaginative tableau by Porzig, Gliederung 203. Meillet (BSL 29, 35) seems to have reached the same result independently. See also Edgerton, quoted in fn. 79. — The case for an IE **ter-* (Kronasser, Handbuch 151. 223.251) is non-existent, even if HH *tarsu* "ter" is correct (Laroche, Ugaritica III, 145).

ordinal **triyana- (te-ri-ya-an-na-)* "3rd", a formation paralleled by *tuyana-* (in *duyanalli-*) and *4-anna* "4th", *5-anna* "5th", *6-anna* "6th", *7-anna* "7th", *8-na* "8th", *9-na* "9th", *10-na* "10th"[75]. Unfortunately, because of the spelling we can only use *triyana-* and **tuyana-* but this is sufficient for our present purposes. Since **tuyana-* is clearly extended from **tur(i)ya* we must conclude that *triyana-* is formed in the same way from an earlier **triya-* and this must represent the inherited IE **triyo-*.

If, then, **triyo-*, i. e. **tri-o-*, can be regarded as the most archaic formation for "3rd", IE **(k^w)tur-(i)yo-* also becomes clear: it stands for an earlier **k^{w}tur-o-* which was formed in the regular manner from the cardinal, but later changed its ending to *-(i)yo-* under the influence of **triyo-*. The importance of this result will be seen when it is compared with the fashionable but arbitrary statement that "3rd" and "4th" have the same suffix *-yo-* as is found in adjectives marking the contrast of more than two terms[76]. The usual examples are **alyos* **medhyos*[77] but these cannot serve their purpose because the semantic definition is not correct and because, from the formal point of view, they are formed, not with *-yo-*, but with *-o-* from pronominal and adverbial stems in *-i-*: **alyo-* is **ali-o-* (cf. *aliquis*), **medhyo-* is **medhi-o-*, and, we may add, **antiyo-* is **anti-o-*[78]. Instead of proving the analysis **tri-yo-*, they support our view that **triyo-* is **tri-o-* and so also our interpretation of **(k^w)tur-iyo-*.

The question now arises how the innovated forms **tr̥tĭyo-* **tretiyo-* **tritiyo-* came into being. It seems evident that they are blended from the original **triyo-* and an innovated **trito-*. The important point is, however, that in spite of the widely attested ending *-tĭyo-*, the new forms cannot be regarded as representing an innovation of the period of IE community. That is ruled out by the fact that the initial syllable shows an unusual breadth of variation such as would be impossible in the case of a well-established IE form. Witness the close agreement in the descendants of **k^{w}etwŏres*. The type **trXtĭyos* is thus a timely warning that even reements over a large area may be due to secondary, convergent develop-

[75] Ahhijawa-Urkunden, 1932, 272[1]; IF 59, 205 f.; Friedrich, Wb. 302 f.

[76] Meillet, BSL 29, 35 (cf. Introduction[8] 262); Lejeune, ibid. 112 f. Meillet is more restrained in Meillet-Vendryès, Traité 388. Stressing the unique character of *-tyo-* in "3rd", Lohmann concluded (ZSPh 10, 1933, 364 f.) that it was a "very archaic" formation and possibly a postvocalic variant of postconsonantal *-yo-* in **alyo-* etc., which is obviously out of the question.

[77] Gk. δεξιός is probably *δεξιϝός (cf. Chantraine, Formation des noms en grec ancien, 1933, 34; and Mycen. *Dekisiwo* ?) and is better omitted from the discussion.

[78] See Brugmann, Grdr.[2] II 1, 164; Wackernagel-Debrunner, AiGr. II 2, 817.

ment, just as the agreement between Umbr. *duti* "iterum" and Prākrit *ducca-* does not establish an IE **dutiyo-* or **dwitiyo-*. We should also bear in mind that the fact that the suffixes *-yo-* and *-to-* combined over the whole area in the sequence *-tiyo-*, and not *-yoto-*, is easily understood: derivatives in *-tiyo-* (from *-ti* + *o-* or *t-iyo-*) did exist while *-yoto-* is unknown. Thus the blend of the old **triyo-* and the new **trito-* could be realized in one way only, but this wide-spread agreement in the development does not prove the IE date of the occurrence.

Nevertheless, the variation between *tri-* and *tr̥-* may preserve something old. Edgerton pointed out[79] that Ved. *tray-/tri-* did not conform to the rules, inasmuch as its various derivatives do not show the expected alternation between *tr̥ri-/tri-*. He was inclined to link this anomaly with "other mysteries" about this stem, esp. *r̥* in *tr̥tĭya-*, *tr̥cá-* "tercet" and *-re-* in Lat. *tre-centī*, Lithu. *trẽčias*, OCS *tretьjь*, both "anomalies" reflecting the regular alternation of an earlier full-grade form **tre-*. If the coexistence of **tre-/tr̥-* and **trey-/tri-* is admitted, "it is not impossible that, in the weak-grade forms recorded with *tri-*, or some of them, *tr̥-* may have been pronounced".

We have already found that **tre-* is unlikely in IE[80], and that it is quite impossible that such a primeval form should have been preserved and used at a time when the expressions for ordinals and hundreds (!)[81] were coined. But if the ordinal **triyo-* (and perhaps certain compounds with a second member beginning in a vowel) existed in Indo-European, the forms in *tr̥-*, if they are to be admitted at all, can easily be explained. According to Edgerton's rules IE **triyo-* necessarily alternated with **tr̥yo-* after heavy syllables and initially. That, in spite of this, the form **triyo-* should have practically eliminated all trace of **tr̥yo-* is, esp. in view of the clear connection with **tri-*, no more surprising than to find that only Vedic *priya-* is attested, not the variant **pr̥ya-*[82], and that only *dhruva-* exists, without any trace of **dhr̥va-*[83], while the alternation **mr̥yo-/mriyo-* survives in Lat. *morior*/Skt. *mriyate*[84]. Thus it is not im-

[79] Language 19, 1943, 122.

[80] It may conceivably have existed in "Pre-Proto-IE".

[81] The only types are those represented by Skt. *trī(ṇi) śatāni* and *tri-śatam*, there is no **tra-śatam* sim. So the *e* of **trecentum* cannot be inherited but is due to assimilation to the accented *e*, see Leumann-Hofmann, 292. The Late Vedic *tr̥cá-* is certainly from **tri-rc-a-* (Renou, Gramm. Véd. 60) and the dissimilation or rather haplology seems to be based on *t(ri)rica-*, indicating *r̥* = *ri*; cf. also the spelling *tricá-*, and see Scheftelowitz, KZ 53, 1925, 263 f.

[82] Edgerton, l. c., § 83.

[83] Edgerton, l. c. § 95.

[84] Edgerton, l. c., § 82.

possible that Ved. *tr̥tīya-* is the resultant of the variant **tr̥ya-* and the new **trito-*. To this extent then the *r̥* of Vedic *tr̥tīya-* would preserve something archaic. But in view of the fact that Ved. *caturthá-*, which competes with the old *turīya-* is certainly refashioned from the expected **catvr̥tha-*, it seems to me much more likely that *tr̥tīya-* owes its *r̥* to the analogy of this form, just as OPruss. *tīrts* is due to *kettwirts*.

The form with *-re-* on the other hand, only found in B-Sl. **tretiyos*[85], cannot reflect an IE **tretos*, for which we should in any case have **tr̥tós*. Its *-e-* must be due to innovation, *-e-* being adopted, instead of *-i-*, from the cardinal when it was still **treyes*, and from the multiplicative (collective) **treyo-* (cf. Lithu. *trejì*) which was itself later replaced in Slavic by *trojь* under the influence of *dvojь*.

The close connection between IE **triyo-* and **(k^w)turiyo-* accounts for the curious fact that the latter did not, or at any rate not from the beginning, develop, according to Edgerton's rules, into **turyo-* (type **diwyo-* not **diwiyo-*)[86]. But the tendency to bring about this change in order to conform to the normal pattern is clearly shown by Hittite which presupposes **tu(r)ya-*, and even by Vedic where the usual compositional form is *turya-*, in e. g. *turya-vāh-*, while Class. Skt. went even further in generalizing *turya-*[87]. But the independent form of the ordinal in Vedic is *turīya-* and we can now see that the lengthening of *i* is due to an attempt to prevent its absorption in the following *y*. This in turn affected the new **tritiyo-* which became standardized as *tr(i)tīya-*, after which even *dvitīya-* was formed[88].

* * *

It emerges then that the original pattern of the ordinals showed as the only tool of formation the thematization of the cardinals. This has now been established for "3rd — 4th" and "6th — 9th". It is therefore inevitable to conclude that "5th", too, was originally **penk^{w}ó-*, or rather **pr̥k^{w}ó-*. Yet, the only formation found throughout the Indo-European territory is **penk^{w}to-*, probably superseding an earlier **pr̥k^{w}tó-*. Where is its new suffix from? Since the suggestion that *-to-* is the wide-spread suffix *-to-* does not explain anything we are driven to the conclusion that

[85] On Lat. *trecentī* see fn. 81 above.
[86] See Edgerton, l. c., p. 105.
[87] Wackernagel-Debrunner, AiGr. III 407.
[88] See Wackernagel-Debrunner, AiGr. II 2, 643 f. Sommer, Zw. 82[1] interprets the length as purely rhythmical; avoidance of three short syllables may indeed have helped.

it is *from the only other number* in the series where the same ending is found, i. e. **dekm̥tos*. Moreover, since the suffix *-to-* in "5th" is generally attested in IE, which means that the (Late) IE form was **p(e)nkʷto-*, we must conclude that its model, **dekm̥tos*, was also general and in fact *the* IE form of "10th". From which it further follows that **dekm̥mos* must be a secondary type.

If **dekm̥mos* is an innovation of the Italo-Celtic and Aryan areas, we might expect to find some trace of the earlier **dekm̥tos* even in these groups. It would seem that such a trace does survive in Italic. The title *meddíss deketasis*, occurring in Oscan inscriptions, has been interpreted as **dekentasi(o)s* "decimarius", based on an unattested **dekento-* "tenth" (from IE **dekm̥to-*)[89]. The objection that *-to-* is not found in the ordinal "10th" in the Italic dialects obviously begs the question and the alternative explanation of *deke(n)tasis* as derived from a blend of **dekemā* "tithe" and **argentāsios* (Lat. argentarius)[90] is unsatisfactory from the formal point of view and unacceptable semantically since the *deke(n)tasis* does not make or manufacture anything. On the grounds of the defective spelling, it has also been derived from a substantive **dek(e)to-* or **dek(e)tā*, from the root **deg-/*dek-* in Gk. δέχομαι[91]. But the fact that *degetasis* and *aragetud* occur in the same inscription[92] shows that the omission of the nasal is no argument against the reading *dekentasio-* while this is supported by the parallel Umbr. *sestentasiaru* "bi-monthly, celebrated every other month" which, because of its second vowel, cannot be a loan from Lat. *sextantarius*[93], quite apart from the fact that the meaning of the latter is quite different. It has also been shown recently that the derivation from **dek(e)to-* is phonetically impossible since *e* in the second syllable cannot be due to anaptyxis, nor could it have escaped syncope if it were original[94]. Thus in this area the earlier **dekento-* seems to have sur-

[89] Whatmough, Language 3, 1927, 107. See also Buck, A Grammar of Oscan and Umbrian, 1928², 138. Vetter, Handbuch (see fn. 92), 11: "nicht erklärt", but only refers to Muller, IF 37, 1917, 198.

[90] Kent, Language 3, 1927, 187 f.

[91] Pisani, Le lingue dell' Italia antica oltre il latino, 1953, 65 f.: (meddix) coactor = "ricevitore".

[92] Vetter, Handbuch der italischen Dialekte I, 1953, Nos. 115. 116.

[93] Vetter, o. c., p. 211 (after Giodànich); Pisani, o. c., p. 200. See now also Scardigli, SE 25, 1957, 273 f.

[94] Untermann, Kratylos 1, 1956, 64. The derivation from **dekento-* "10th" is accepted by Walde-Hofmann I 329, Pokorny, IEW 191, and quite recently by Haas, Lingua Posnaniensis 5, 1955, 94 fn. 12, and Giovannangelo Camporeale, Atti dell' Accademia Toscana 1956, 99 f.

vived in certain technical terms, but in the normal functions of the ordinal it was replaced by the new **dekm̥mos* type[95].

But if the original form of "10th" was **dekm̥tos*, then, in view of the fact that the ordinals are formed with *-o-*, we can state that **dekm̥tos postulates a cardinal *dekm̥t*. It is also clear now that **dekm̥tos* first influenced **p(e)nkʷos* which thus became **p(e)nkʷtos*, a change paralleled by the curious Arcadian ordinal πέμποτος which is clearly reformed after δέκοτος[96]. In point of fact, within the set "3 — 10", it is only in "5" and "10" that *-to-* is firmly embedded from Indo-European times[97].

The further spread of *-to-* in the series "3 — 9", and even "1 — 9", is post-Indo-European, as is proved by the fact that, with the single exception of "3rd", the old forms still survive without it, and that the analogical formations gained ground to a varying extent in the different languages.

The pressure of "5" was strongest on "6" where the original **(s)weksos* or **(s)uksos* is almost generally replaced by **swek(s)tos*. On the other side, the post-IE **tr(i)tiyos* presupposes a new **tritos* which cannot have been produced by "5th" but only by "4th" or "6th" or their combined influence. In any case, **trito-* presupposes **kʷetwr̥to-* which is of course due to **p(e)nkʷto-*.

While "3 — 6" thus sooner or later adopted the clear suffix *-to-*, the series "7 — 9" successfully resisted the pressure from both ends ("6th" and "10th"). This is plainly due to the clear and consistent structure of

[95] Cf. *Dekmanniúis* (Vetter, o. c., p. 107), although this could be a loan from Lat. *decumanus*. For the survival of the old formation in a technical use, cf. Engl. *tithe* as against "normal" *tenth*.

[96] This is also Sommer's view: "Das falsch losgelöste *-to-* wird zunächst vom 'zehnten' nur (!) auf den 'fünften' unter der Aegide der Fingerzählung übergegangen sein und von da weitergewuchert haben" (Zw. 63[1]).

[97] The first, tentative, statement of my view of the origin of the ordinal-suffix *-to-* was given in Archivum Linguisticum 1, 1950, 191 fn. 1. But see already Schwyzer, GG I 595 last paragraph, and now Wackernagel-Debrunner, AiGr. II 2, 720; Risch, Glotta 33, 1954, 216. It should be noted, incidentally, that the survival of *-to-* in Aryan **tr(i)tiya-* proves that Skt. *-tha-* is secondary, and so speculations about the direct IE origin of the aspirate (e. g. Meillet's "expressive" *-tho-*, Symb. Rozwadowski I, 1927, 107) must be abandoned. It is, however, possible that *-th-* in the superlative suffix *-iṣṭha-* is (partly ?) inherited and the close ties between ordinals and superlatives, rightly emphasized by Benveniste, led to the ordinal being changed to *-tha-*. Note, however, that according to R. Hiersche (MIOF 6, 1958, 107[12]) even *-th-* in *-iṣṭha-* is secondary. Ved. *pāṅkta-* should also be remembered in this connection. Burrow's derivation of *(catur)tha-* from a thematized IE abstract in *-teH-* (Sanskrit 195. 261) is ruled out by the lateness of -tha-.

this set: the transparent, yet unmistakably characterized, pairs **septm̥* — **septm̥mos*, **oktō* — **oktowos*, **newn̥* — **newn̥nos*, formed a coherent group which was influenced only at a late stage, and even then only over part of the area[98].

Thus, for "7th", we find in the Avesta only *haptaθa-*. Its apparent agreement with Skt. *saptatha-* naturally led to the reconstruction of an Aryan **saptatha-*. But the Sanskrit form is found only three times in the RV and again three times in the Kāṭhaka (see Wackernagel-Debrunner, AiGr. II 2,721); the regular form, throughout the history of Sanskrit, is the inherited *saptama-*. It is therefore just as ill-founded to infer an Aryan **saptatha-* as it would be to infer an IE **septm̥tos* from these forms and their agreement with Gmc. *seƀunđaz* and Lithu. *septintas*. In both branches of Aryan, "7th" could at any time be innovated after the group "5th — 6th" (in post-RV-Indian even "4th — 6th"). In Iranian, in particular, the preceding ordinals **pa(n)xta- *(x)šwašta-* were quite sufficient to produce the innovated **hafta-ta-*. But in that case how can we account for Av. *-θa-*? For, as was pointed out above, there is no justification for the assumption of an IE ordinal suffix *-tho-*, or of an Aryan *-tha-* for that matter. Now it would be easy, perhaps too easy, to assume that Av. *-θa-* is a problem of textual transmission, that is, represents spoken *-ta-*. But even if we admit the linguistic reality of *-θa-*, the explanation is not far to seek. Since, apart from a few case-forms, the feminine regularly developed *-θy-* from *-ty-*, and the derivative *haptaiθya-* "containing seven parts" also had a regular *θ*, it is easy to understand that, in order to avoid the alternation *-t-/-θ-*, the ordinal generalized *-θ-*. This *-θ-* is responsible for the "puzzling" *-θ-* of *haptaiθivant-* "seventy-fold" which was even extended to *aštaiθivant-* "eighty-fold".

"8th" suffered some changes because of the difference in the vocalism between **oktowos* and **oktō(u)*, a difference only preserved in Greek and, with a slight modification, in Aryan where **aśtawa-* gave way to *aśtama-* under the influence of *saptama-*. In Latin, **oktowos* was lengthened to **oktōwos* after *octō* and then changed to *octāuos*[99]. In the Germanic lan-

[98] Sommer (Zw. 63[1]) thinks that "7th" "8th" resisted *-to-* because of their internal *-t-*, and that "9th" followed suit.

[99] See Szemerényi, KZ 70, 1951, 51 – 2. Martinet's explanation of *-ā-* in *octāuos* (Word 9, 1953, 258, and now Économie des changements phonétiques, 1955, 219, without noticing my earlier paper) is to me doubtful on general grounds and too early in this particular case. Pisani's derivation of *octāuos* from **oktuāwos* (RAL 6/8, 151) is without foundation. Meillet (Ernout-Meillet, Dict. étym. de la langue lat. 663) starts from **oktowos* which became **oktawos* and, after *octō*, *octāuos*; but see Szemerényi, l. c.

guages the suffix *-ðа-* spread from "10th" and "5th — 6th" to the ordinals between them, in most cases being added directly to the cardinal. But Goth. **ahtūda* (attested in the dat. *ahtūdin*) is not quite clear. Brugmann thought that *-ū-* might have resulted from IE *-ōu-* introduced from the cardinal[100], but the change of *-ōu-* to *-ū-* is unlikely. On the other hand, there are several examples of *ū* representing an *ō* (e. g. *supūda* instead of *supōda*, *ūhtedun* for *ōhtedun*) and, conversely, *ō* standing for *ū* (e. g. *ōhteigo* "at the right time", i. e. *ūhteigo*)[101]. It is thus possible that *ahtūdin* represents *ahtōdin*, which would be from **oktōtos* replacing an earlier **oktou-to-s* (and this a still earlier **oktowos*), whose *-ou-* was changed to *-ō-* after **oktō*.

Among the descendants of IE **newn̥nos* "9th" Gk. ἔνϝατος is remarkable. It clearly stands for an earlier *ἔνϝανος (or still *-n̥nos*) where the ending was replaced after δέκατος (or still *-m̥tos*). Less clear is the relation of the stem-form ἐνϝ- to ἐννέϝα and of both to the IE form. The initial ἐ- is fairly certain to represent a purely Greek, or, since it is also found in Armenian *inn*, an Armeno-Greek prothesis[102], and I believe that Sommer's suggestion for -νν- is correct: *ἐ νεϝα was transformed to ἐν νεϝα after the syllabication of ἐν ϝα-[103]. But it seems to me impossible that the stem-form of *ἐνϝ-ανος should be capable of establishing an IE form **enwn̥*[104]. I prefer to regard **enwn̥nos* as a purely Greek innovation for **enewn̥nos* by reduction of the volume, to bring it into line with the trisyllabic forms **septm̥mos* **oktowos* **dekm̥tos*; the new stem-form ἐνϝα- was later extended to other usages.

The Gaulish form of "9th" is also interesting. La Graufesenque produced a form which was read as *NAVMET(OS)* by the first editor[105] but was shown by Thurneysen to be *NAMET(OS)*[106]. The strangely reduced form of "9", *na-*, had been clarified in advance by Pokorny who had shown

[100] Grdr.[2] II 2, 56. Sommer (Zw. 25 with fn. 1) regards it as certain that an IE nil-grade formation **oktwos* is continued by Gmc. **axtuwaz* and Gk. ὄγδ(ο)ϝος, but the basic form is unacceptable because of Edgerton's law. Most recently O. F. Jones, Language 34, 1958, 35 f.

[101] See Kieckers, Handbuch 21. 16; Streitberg, Got. Elementarbuch[6] 50.

[102] For Thraco-Illyrian forms see Bonfante, JAOS 65, 1944, 189; Mayer, KZ 66, 1939, 112 f.

[103] Zw. 27. But we cannot posit for the cardinal an IE **enewn̥* beside **newn̥*. Mycenaean *enewopezo* does not reveal the quantity of *-n-*.

[104] Pisani, Ricerche Linguistiche 2, 1951, 49. I shall discuss *inn* elsewhere.

[105] See Loth, RC 41, 1924, 38; accepted by, e. g., Lewis-Pedersen, Comp. Celt. Gr. 193.

[106] ZCP 16, 1927, 300.

that Welsh *naw* etc. presupposed that IE **newn̥* became British **nowan* and by assimilation **nawan*[107]. It is thus clear that Gaul. *nametos* is contracted from **nawa-metos* which was formed from **nawamo-*, earlier **nowamo-*. This is obviously reformed from **nowano-* (IE **newn̥no-*) after the preceding ordinals **sextamo-* and (after it) **oxtūmo-*. The new compact group "7th — 9th" even changed the inherited **dekanto-* to **dekamo-*, and eventually *-eto-* was added to all[108].

The great vitality of the ending *-tos* is clear both in the Celtic forms just mentioned and in Homeric Greek where δέκατος is the ultimate source of the long series of ordinals seen in εἶνατος ὀγδόατος ἑβδόματος — τέτρατος τρίτατος.

We cannot pursue here the highly interesting and instructive transformations that have taken place in the various languages. They would only corroborate our previous finding that the numerals almost behave as a closed system within the greater system of language. Their growth is determined by internal cross-influences and not outside intrusions.

But from a general IE point of view it is worth pointing out that the ending *-to-* of **dekm̥tos* spread not only to the lower units but also to the decads. The three linguistic groups that preserve the old formations, exhibit two different types: Greek has εἰκοστός etc., and in a more archaic form Boeot. ϝικαστός etc., pointing to IE **wīkm̥t-to-* etc., while Aryan and Latin reflect **wīkm̥t-tm̥mo-*. Here again, if we apply the general theory of marginal areas, it can be said, and has in fact been said, that the agreement between Aryan and Italic proves an IE suffix *-tm̥mo-* for the higher ordinals[109]. It seems, however, fairly clear that the original formation was different, namely exactly the same as in the case of **dekm̥tos*. Just as the ordinal to **dekm̥t* "10" was **dekm̥t-o-s*, so beside **wīkm̥tī* **trīkont* etc. there were **wīkm̥t-o-s* **trīkm̥t-o-s* etc. Under the influence of **dekm̥tos*, however, the simple *-o-* was replaced by the clearer ending *-to-*, and the new type **wīkm̥t-to-s* **trīkm̥t-to-s* etc., still of IE date, is clearly reflected in Greek. We must therefore regard the agreement between Aryan and Italic as purely "fortuitous", that is, as based on convergent development:

[107] IF 38, 1920, 190 f. Cf. Jackson, Language and History of Early Britain 368 – 9 (is IE **newm̥* there a misprint for **newn̥* ?).

[108] It seems pretty certain that the changes occurred when the forms still lacked *-etos* (ultimately from *pimpe-tos* by wrong division).

[109] Leumann-Hofmann, 294; Wackernagel-Debrunner, AiGr. III 403. 408 f.; but cf. Brugmann, Grdr.[2] II 2, 60, and esp. II 1, 288: "Vielleicht sind die beiden Sprachzweige (Aryan and Italic) unabhängig von einander zu diesem *-tm̥mo-* gekommen".

-tmmo- is in the two areas the result of parallel development, not an inherited morpheme. The reason for the innovation is also clear: both Aryan and Italic introduced **dekmmos* in place of the inherited **dekmtos* because for the cardinal they generalized the preconsonantal variant **dekm*. Hence the inherited **uīcenssos *vīšattas* etc. added the new ending of the basic unit, and so **uīcenss-imus *vīšatt-amas* etc. came into use. On the Aryan side the innovation can still be perceived. As is known, beside the forms with the long ending *-tama-* we also have the "mutilated" type (Skt.) *vimśa- trimśa- . . . pañcāśa-*, and, later and less frequently, *ṣaṣṭa- saptata- aśīta- navata-*. It is usually assumed that these are innovated after the additive numerals "11" etc., which form *ekādaśa-* "11th", *dvādaśa-* "12th" etc.[110] But the innovation is not clear there either; besides, if the only inherited forms had been in *-śat(i)tama-*, it would be difficult to see how they could have been reduced to the vanishing point, e. g. *vimśa-* and from **ṣaṣṭitama ṣaṣṭa-*. It seems to me that the decads are based on the old ordinals with *-to-*: *aśīti-ta-* "80th" became, by haplology, *aśīta-*, and similarly *ṣaṣṭi-ta-* > *ṣaṣṭa-*, *saptati-ta-* > *saptata-*, *navati-ta-* > *navata-*[111].

But the vitality of the ending *-to-* was still not spent, it went even further, beyond the numerals. Benveniste has recently shown that the curious agreement between the formations of ordinals and superlatives is due to the fact that the superlatives, for reasons of semantic contiguity, took over the ordinal morphemes[112]. This had, of course, been taught already by Brugmann, who clearly stated that the superlative suffixes *-mmo-/-mo-* and *-to-* are based on the ordinals[113]. If this is true, then the innovation is even more singular than it has been thought to date: since the suffix *-to-* of the ordinals is based on the (false) division **dekm-to-* instead of **dekmt-o-*, the whole impressive edifice of ordinals and superlatives is based on one single word, although, to be sure, it is as fundamental a number as "ten".

* * *

[110] Wackernagel-Debrunner, AiGr. III 409.

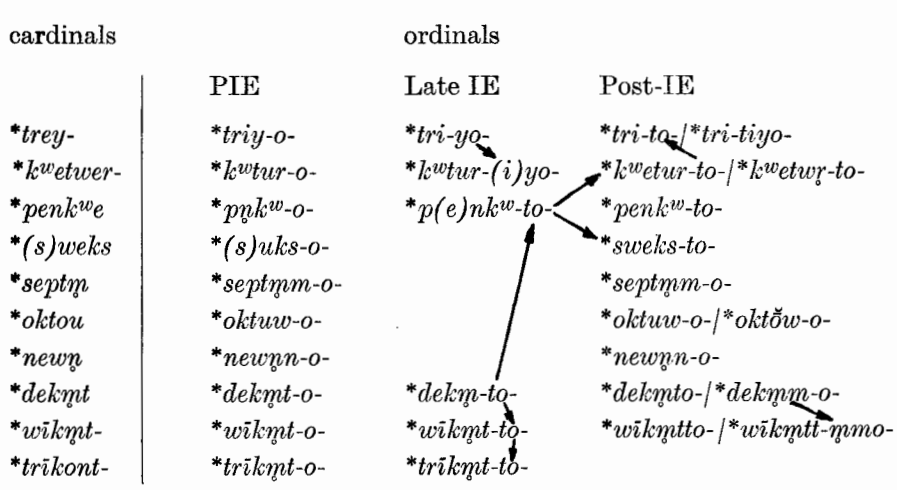
[111] Haplology accounts also for the later type *trimśatima-* (Wackernagel-Debrunner, l. c.), i. e. **trimśati(ta)ma-*.

[112] Noms d'agent et noms d'action en indo-européen, 1948, 161 f.

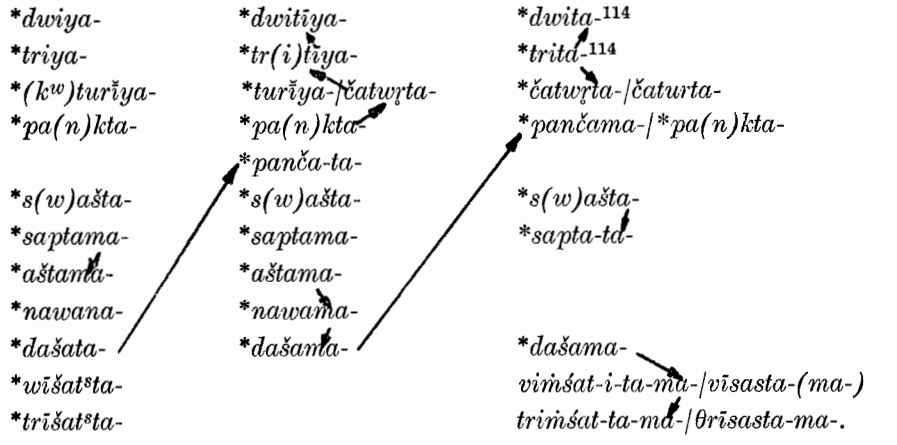
[113] Brugmann, Grdr.[2] II 1, 163 f., 225, 390 f. Cf. already Saussure, Mémoire, 1879, 31[1] and more recently, independently of Benveniste, Kacnel'son, Istoriko-grammatičeskije issledovanija I, Moscow-Leningrad 1949, 236 f., 243 f. (Cf. Ivanov, Voprosy Jazykoznanija 1957/5, 13, and: Tezisy dokladov . . . o sootnošenii sinxronnogo analiza i istoričeskogo issledovanija jazyka, Moscow 1957, 32). I am greatly obliged to the author and Dr. V.V. Ivanov for making this book available to me.

Here again it may be useful to tabulate the results of the preceding discussion.

For Indo-European times the following picture seems to emerge:

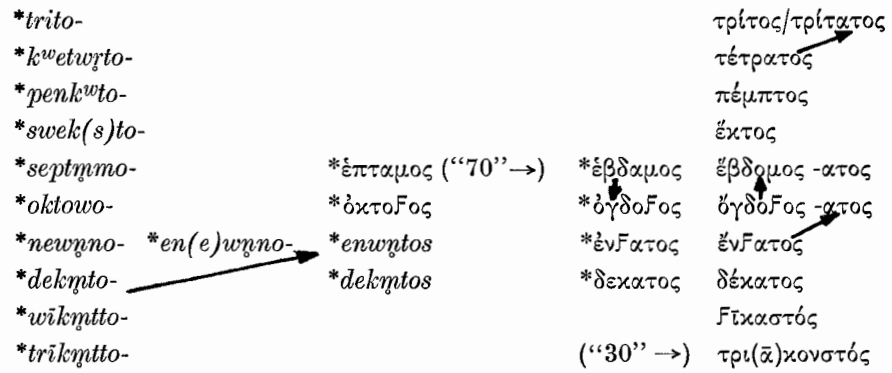


The Indo-Iranian developments can be outlined in the following composite diagram:



[114] Cf. Khot. *śäta-* < **dvita-*, *dädda-* < **tr̥ta-* (!?) (Konow, Khotansak. Gram. § 34); MParth. *byd*, Mpers. *dit* (Bartholomae, Zum AiWb., 1906, 63 fn.); Skt. *dvita- trita-*, Wackernagel-Debrunner, AiGr. III 406; II 2, 589; Wüst, PHMA 1, 1955, 28.

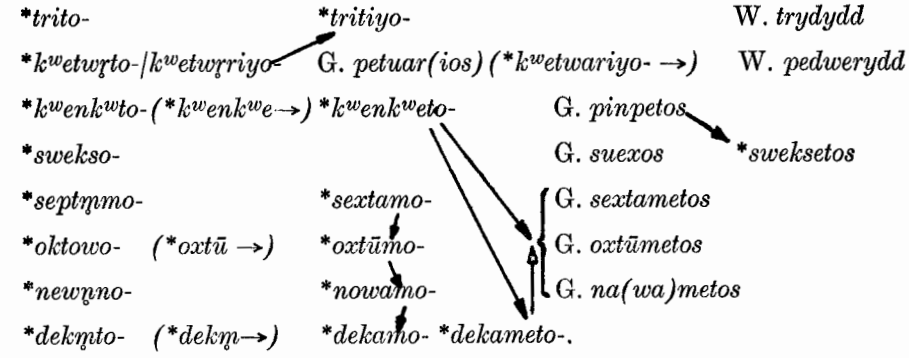
The secondary transformations of Greek centre on the set "7th — 9th":



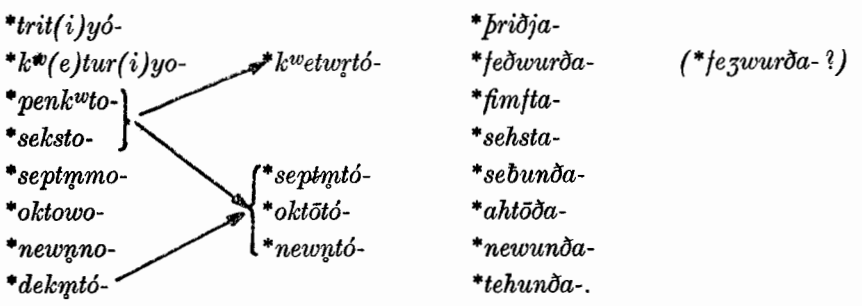
The Latin system shows only a few changes from the inherited system:

**tritiyo-*	(after **ters* < **tris* on the model of **quaters* < **kʷetrus*)			*tertios*
**kʷetwr̥to-*	(after *quattuor*)	**quatwortos*	**quawortos*	*quārtos*
**penkʷto-*				*quīntos*
**seksto-*				*sextos*
**septm̥mo-*				*septimos*
**oktowo-*	(after *octō*)	**oktōwos*		*octāuos*
**newn̥no-*				*nōnos*
**dekm̥to-*	(after **dekm̥*)	**dekm̥mos*		*decimos*
**wīkm̥tto-*		**wīkenssos*		*uīcē(n)s-imos*

Somewhat more complex are the reformations which led to the peculiar Celtic system. Here "5th" proved to be the pivotal member of the set.



The distinguishing feature of the Germanic set is the generalization of the suffix *-to-* in the series "4th — 10th":



Much more original in the reshaping of the inherited set of ordinals (and cardinals) was the Baltic, and especially the Slavic group. But in view of the complex reshufflings it will be more useful to discuss them further on (see p. 109 f.).

Tokharian went even beyond Germanic in generalizing *-to-* which appears in the whole set "2nd — 10th". A further interesting feature is the extension of the nasal of **septm̥to-* and **newm̥to- *dekm̥to-* to "8th": B *ṣuktante, oktante, ñunte*[115], *śkante*. But it is perhaps rash to conclude that A, where "8th" is not (yet) attested, had a similar form[116]; note the difference between B *oktaṅka* "80" and A *oktuk*.

* * *

We must now turn to Armenian where a curious ordinal-formation has given rise to far-reaching conclusions which have a bearing on our interpretation of the IE ordinals. Armenian has introduced a new system which bears no resemblance to that of the other Indo-European languages. We find there *erkrord* "2nd", *errord* "3rd", *c̣orrord* "4th", *hingerord* "5th", *veçerord* "6th", *eut'nerord* "7th", *ut'erord* "8th", *innerord* "9th", *tasnerord* "10th".

The suffix-form *-erord* of "6th" etc. clearly spread from *hinge-rord*[117], but even *-rord* is not a primary suffix as is shown by the fact that for "2nd — 4th" we have shorter forms:

[115] There is no *ñ(u)wemte*, see Couvreur, Hoofdzaken 51 fn. 36.
[116] As is assumed by, e. g., Bonfante, IF 52, 1934, 224[3]; Windekens, Morphologie 217.
[117] Meillet, Esquisse d'une grammaire comparée de l'arménien classique, 1936[2], 101.

"2nd"	*erkir*	beside	*erk(i)rord*
"3rd"	*erir*	beside	*er(i)rord*
"4th"	*č̣orir*	beside	*č̣or(i)rord.*

Meillet added to this group *krkin* "double" from an earlier **kir-kin*, which would represent the same type in the first part **kir*, while *kin* is the general multiplicative suffix[118]. All three would thus represent a formation characterized by *-ro-*, and *hingerord* is thus also based on an earlier **hingero-*. This had long before been equated by Meillet with Goth. *figgrs* "finger"[119] and now he concluded that an archaic IE formation, perhaps *the* original IE form of "5th", was the source of all Armenian ordinals. For the IE form in *-ro-* he again thought of a contrasting function of the suffix, marking the term in opposition to "10". Lejeune at once attacked this theory[120] — very politely, to be sure — and it is indeed impossible to build such an edifice on *hingerord*, especially as a far simpler source is close at hand.

We have seen that the original forms of "3rd — 4th — 5th" were **tri(y)o- *(k^w)tur-o- *pṇk^{w}to-*. It seems clear that Arm. *erir* continues the inherited **triyo-* influenced by **(k^w)turo-*, i. e. a contaminated **triro-*. "4th", on the other hand, obviously has its *-ir-* from "3rd", but here the stem was brought into line with the cardinal *č̣orek'*, hence *č̣or-ir*. It was after these that "5th" acquired the form *hinge-r-*.

Even the additional *-ord* seems to be due to false division, rather than represent a second member, whether this be *ordi* "son" (!)[121], or an IE **kort-i-* comparable to Skt. *sa-kṛt-* "once" etc.[122] Since *-rd-* must derive from IE *-rt-* and thus the ordinal suffix points to an earlier *-ortos*, we cannot help thinking of Lat. *quārtus* from **quatwortos* and similar cases. In other words, besides the inherited IE **(k^w)turo-*, or restored **k^{w}eturo-*/ **k^{w}etworo-*, a new **k^{w}etworto-* seems to have come into being, formed after the inherited **p(e)nk^{w}to-*, which eventually gave **č̣ord*, existing side by side with *č̣orir*, just as Sanskrit has *tur(ī)ya-* beside *caturtha-*, and as Indo-European used concurrently the old **triyo-* and the new **trito-* for some time. But in the end the two forms merged in *č̣or(i)rord* and thus a

[118] BSL 29, 36.

[119] MSL 9, 1896, 157 – 8.

[120] BSL 29, 110 f.

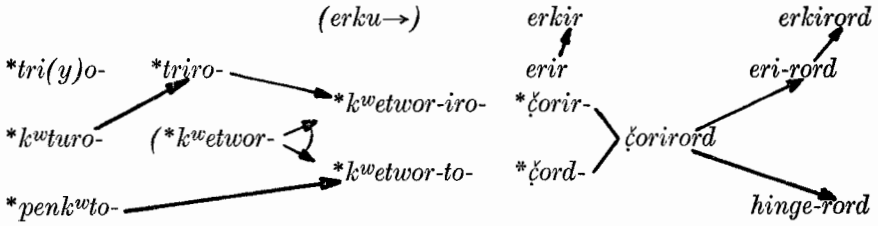
[121] Pedersen, KZ 39, 1905, 360; cf. also Patrubány, Sprachwissenschaftliche Abhandlungen 2, 1900, 169.

[122] Pisani, KZ 68, 1944, 174, assuming dissimilation in **erkr-kord* to *erkr-ord*; but he explains neither the phonetics (IE *k-* should give *k'*), nor the semantics.

new, well-characterized suffix was available which was then extended to the whole series, starting with *aŕaǰn-ord* "first" and so forth[123].

One word must be said about *krkin* "double" which Meillet traced to an old **dwir-(kin)*, assuming that the internal *-r-* prevented the normal development of *kr-* (later *erk-*) from **dw-*[124]. But Pisani has successfully undermined the strange doctrine that, although *-dw-* develops into *-k-*, nevertheless *dw-* resulted in *kr-*, later *erk-*, in contrast to *tw* which gave k^c in both positions[125], and he is obviously right in deriving *krkin* from **kru-kin*, where **kru-* is the early form of the cardinal "2"[126], the form expected in the series *mekin krkin erek'kin* etc. There is thus no basis for positing an IE **dwir-*[127]. A later stage is represented by *erkir*.

The major steps of the development are brought out in the following diagram:



However, the question of the suffix *-r-* raises yet another problem. As is known, numeral formations with *-r-* are found in several IE languages, not only in Armenian. In Balto-Slavic they appear as collectives. More precisely, in Slavic we find neuter substantives, starting with *četvero (četvoro)* "(group of) four", and adjectives of the type *četverъ/četvorъ* "fourfold", so that we have the series:

četve/₀rъ pęte/₀rъ šeste/₀rъ sedme/₀rъ osme/₀rъ devęte/₀rъ desęte/₀rъ.

In Baltic they are plural adjectives used with plural nouns of singular meaning: Li. *ketverì, penkerì, šešerì, septynerì, aštuonerì, devynerì*[128].

[123] Whether this suffix is identical with *-ord* in words other than ordinals (Pedersen) need not be discussed here.

[124] Meillet, Esquisse² 51.

[125] Meillet, ibid., and earlier in MSL 15, 1909, 353; Pisani, KZ 61, 1934, 185; 68, 1944, 164; Ricerche Linguistiche 2, 1951, 54 – 5.

[126] IE *dwō* gave Arm. **ku* which, after **trēs*, became **kru* and eventually *erku*.

[127] Even less an IE **dwi-dwis-no* (L. Mariès, REIE 1, 1938, 445, known to me only from Pokorny, IEW 231, and IJb 26, 180).

[128] For the facts, see Vondrák, Vgl. slavische Grammatik I, 1924², 561; P. Diels, Altkirchenslavische Grammatik I, 1932, 220; Vaillant, Manuel du vieux slave I, 1948, 159; J. Otrębski, Gramatyka języka litewskiego III, 1956, 172 f.

In Old Irish the so-called personal collectives are *-o*-stem neuters ending in *-r*: *oínar (dias) triar cethrar cóicer se(i)sser mórfes(s)er ochtar nónbor de(i)chenbor*[129].

A suffix *-r-* is also used in Tokharian to form distributive numerals: B *somār* "singuli", *wyār* "bini", *śwerār* "quaterni", *ñuwār* "noni", *śkăr* "deni"[130].

Finally, Italic offers Osc. *pumperia*, Umbr. *pumpeřia* (from **kʷenkʷeriyā*) and Lat. *decuria centuria*.

There is obviously close agreement between all these formations, both in the suffix and in the collective-distributive function, and it is clear that the elements of the formations must reach back to Indo-European. Meillet, who saw something very archaic in Arm. *hinger(ord)*, emphasized the agreement with OIr. *cóicer*, Lithu. *penkerì*, to the exclusion of the other forms[131]. Yet, viewed in its context, the formation falls into line with general IE principles which help to clear up the formation. In Balto-Slav in particular, it is evident that the set starts with "4" and does not usually go beyond "10"; its appearance in "100" (cf. OCS *sъtoricejǫ* "hundred times", Lithu. *šimteriópas* "hundredfold", *šimtérgis* "hundred years old") is due to secondary extension from "10", as in Lat. *centuria* from *decuria*. For "2" and "3", on the other hand, we find Sl. *dvojь trojь*, ntr. *dvoje troje*; Lithu. *dvejì trejì*, which have their counterparts in Skt. *dvaya-* "double", ntr. *dvayam* "pair", *traya-* "treble", *trayam* "triad", and Gk. δοιοί, and certainly derive from IE **dweyo-/dwoyo-*, **treyo-*. If now the set **dweyo- *treyo- *kʷetwero-* is examined, it becomes clear that all its members represent the same formation: the thematization of the full-grade form of the corresponding cardinal. Thematization was thus used twice over, but with a morphological and a corresponding semantic difference: from the nil-grade of the cardinal the ordinals **dwiyo- *triyo- *kʷturo-* were formed, while from the full-grade of the cardinal the corresponding collective-distributive numerals were obtained[132].

This being so, the forms to be expected for "5 — 10" (if they were formed at all at that early date) would be **penkʷo- *s(w)ekso-* etc., which, however, are nowhere attested. If, instead of these forms, we find in Balto-Slav the sets Lithu. *penkerì . . . devynerì*, Sl. *pęterъ (-orъ) . . . desęterъ (-orъ)*, we must conclude that they cannot represent inherited IE format-

[129] Thurneysen, Grammar of Old Irish 243 f.

[130] Windekens, Morphologie comparée du Tokharien, 1944, 218.

[131] BSL 29, 36 f.

[132] Meillet, BSL 29, 36 f., failed to observe this and recognizing only the collective type blocked his own path to the understanding of the ordinals.

ions but, as is manifest from the ending *-erì/erə*, are modelled on the inherited form **k^{w}etwero-* whose ending was transferred to **penk^{w}e* etc.[133] The analogical spread of the characteristic ending is particularly clear in Lithuanian where it penetrated even into "1" and "2": beside *vienì dvejì* there are *vienerì dvejerì*[134]. The Tokharian forms are in close agreement with this general line of development, although the details are far from being clear[135].

This result confirms our earlier conclusion that Arm. *hinger(ord)* cannot represent an IE, let alone *the* IE, form of "5th". But it also paves the way to an understanding of the forms found in the other languages. If Old Irish has a whole set of personal collectives in *-r*, this morpheme cannot be traced to a suffix *-aro-*[136] or the noun *fer* "man"[137] — although popular etymology, connecting the formation with *fer*, seems to have been at work in shaping "9" and "10" — but only to *-ero-*, the ending of the inherited **k^{w}etwerom* "foursome", which was first extended to **k^{w}enk^{w}e* and then carried up to "10".

It also helps us to understand the formations found in Italic. In accord with his general approach, now confirmed by our own results, Brugmann explained Italic *pomperia* as an innovation on the model of **k^{w}etweriyā*, just as the Lithu. *-ya*-stem in *penkerì* is based on *ketverì*[138]. Meillet objected to this on the grounds that Lithu. *penkerì* need not be modelled on *ketverì*, and that Brugmann could not explain Lat. *decuria centuria* from "4", except by "arbitrary hypotheses"[139]. But we have seen that Lithu *penkerì must* be formed after *ketverì*, and also that in general there is no justification for a suffix *-ro-* in the numerals — except as an innovation based on the pivotal word **k^{w}etwor-*. We are therefore driven to the conclusion that an Italic *pomperia*, earlier **k^{w}enk^{w}eriyā*, must be based on

[133] Cf. already Brugmann, Die distributiven und die kollektiven Numeralia der idg. Sprachen (Sächsische Abhandlungen 25/5), 1907, 25; Vondrák, l. c., as against Meillet, MSL 17, 1912, 293. See also Nehring, WS 12, 1929, 275.

[134] For "3" there is no **trejerì* — obviously for reasons of euphony.

[135] Windekens, l. c., starts from a ntr. pl. in *-ā* to which *-r* was added, but this is very unlikely.

[136] Pedersen, Vergl. kelt. Gramm. II 136, but p. 50 it is admitted that, when there are no British forms — as is the case here — it is impossible to tell whether the suffix was *-aro-* or *-ero-*.

[137] Thurneysen, GOI 243 (accepted by Sommer, Griech. Nominalkomposita, 1948, 47); but are there such compounds in IE ? (e. g. Lat. **bi-uirom* ntr. "a pair of men" ?)

[138] Brugmann, Grdr. ^{2} II 2, 77, and already, Die distr. . . . Numeralia 26.

[139] Meillet, MSL 17, 1912, 293.

**k^{w}etweriyā*, even though the latter does not survive. This evasion of the inevitable even led to the strange assumption, first voiced by W. Schulze, and readily taken up by Meillet[140], that Lat. *decuria* is based on an IE *deku-* "10", a form whose existence, beside the uniformly attested **dekm̥(t)*, could only be admitted on the most cogent grounds. Schulze argued as follows: Osc. *pomperio* is to be understood as **pompe-riā*, formed from *pompe* in the same way as Lithu. *penke-rì* from IE **penk^{w}e*; *centuria* has its *-u-* from *decuria* which is built in the same way as *pompe-riā* and whose stem is justified by the Goth. *-u*-stem *tigu-*; thus we obtain an independent stem-form **deku-* which will be easily discovered also in Umbr. *tekvias*, representing a noun **dekuw-iā*. Can this be regarded as a cogent demonstration? The answer clearly is *no*[141].

To begin with, U. *tekvias* (and Osc. *Dekkviarim*) which Schulze interpreted as "das Zehngeteilte", cannot be used at all, as a glance at the texts and the modern commentators will show[142]. Thus we are left with *decuria*[143] and the Gmc. **tegu-*. The latter, as we have shown and as had always been held before Schulze, continues IE **dekm̥(t)*. If the whole evidence is thus reduced to *decuria*, we must clearly try every other possibility before we infer an IE **deku-*[144]. And since Italic **k^{w}enk^{w}eriyā* does exist, we must conclude that *decuria* is closely linked with it. But how? That *decuria* should be based on a **quincuria*, and this in turn on **quaturia*[145], is basically correct but from the formal point of view inadequate since it does not account for the *-e-* vowel of Osc-Umbr. *pomperia*. This, however, is by no means a sufficient reason for ascribing the formation to Etruscan[146] since the explanation of the differing vocalism in *pomperiā* — *dekuriā* is quite simple.

[140] Schulze, Zur Gesch. der latein. Eigennamen, 1904, 545 f.; Meillet, MSL 17, 293; Caractères généraux des langues germaniques, 1926^{3}, 226 (even **d°ku-* beside *deku-*!); Benveniste, Origines 37 (**deku-* and *deku-r*); Pokorny, IEW 191 f.; Krause, Handbuch 176; Pisani, Le lingue dell' Italia 196 and Essays for R. Jakobson, 1956, 391.

[141] Cf. Sommer (Zw. 49 fn. 1): "Ein voreinzelsprachliches Zahlensubstantiv **dekús* zu **dekm̥(t)* vermag ich freilich einstweilen morphologisch nirgends unterzubringen".

[142] Vetter, Handbuch der italischen Dialekte, 205: probably adj. *tekwio-* "abgabepflichtig"; Bottiglioni simply puts "**decuuiae*" (Manuale 122); Pisani, Lingue 196, accepts the derivation from **deku-*. See also Devoto, SE 22, 1953, 169 – 173.

[143] Lat. *decussis* obviously does not prove anything, see Sommer, Zw. 43 f.

[144] Schulze's construct was rejected at once by Brugmann, Die distr. . . . Num. 26.

[145] Leumann-Hofmann, 208; Nehring, WS 12, 1929, 275.

[146] Ernout, BSL 30, 1929, 105^{3} = Philologica I, 1946, 38^{2}; but see Walde-Hofmann I 328.

The form **kʷenkʷeriyā*, the forerunner of Osc-Umbr. *pomperia*, is palpably based on a **kʷetweriyā*, extended from the inherited collective **kʷetwero-*. This means that the corresponding term for "10", based on **kʷenkʷeriyā*, led to the creation of a primitive **dekweriyā*. Now while the former resulted in Osc-Umbr. *pomperiā*, the latter became, by samprasāraṇa, **dekuriā*[147]. That **dekweriyā* did not develop into O-U. **deperiā*, is easily understood since the reduction of **dekweriyā* to **dekuriā* occurred before the labialization of the labiovelars[148] and the sequence *-kw-* in **dekweriyā* would, because of the close connection with *dekem*, have survived in any case as is shown by *Dekkviarim* (whatever its etymon) where *-kk-* reveals the consonantal character of *-v-*. O-U. *pomperiā*, or rather the primitive **kʷenkʷeriyā*, on the other hand, did not undergo the syncope because its connection with **kʷenkʷe(pompe)* prevented this.

* * *

We thus find that the alleged IE ordinal **penkʷeros* is non-existent. The only form that is attested or can be postulated is **penkʷtos* (or earlier **pn̥kʷtos*), which, with its unique suffix in the series "3 — 9", must owe its ending to the analogy of **dekm̥tos*. This in turn postulates the analysis **dekm̥t-o-s* and therewith the cardinal **dekm̥t*. We have also seen that there is no foundation for the assumption of an IE by-form **deku-*.

But, since IE **dekm̥t*, before the period of weakenings, must have sounded **dekomt* (or **dekemt*), the question may be asked whether there are any traces of this earlier form. From the IE point of view, the decad-morpheme *-kont* clearly reflects this vocalism of the second syllable. But can it be assumed as the variant of the normal cardinal **dekm̥t*?

Here again Germanic evidence is used to give substance to such an assumption. In contrast to Goth. *taihun*, which certainly represents IE **dekm̥t*, OHG *zehan* and OS *tehan* seem to point to an IE ending *-om(t)*, and many scholars, taking the evidence at its face-value, postulate an IE **dekom* or **dekomt*, or even **dekomd*[149]. But even those who assume

[147] Buck, Grammar of Oscan and Umbrian, 1928², 60.

[148] Cf. Osc. *facus* "factus" from *fak-wos*, Buck, o. c., 60 § 91. 1, and forms such as Umbr. *fiktu* "figito", *ninctu* „ninguito", Osc. *fruktatiúf* „fruitio" (ibid. 153) with full syncope; cf. also Moorhouse, AJPh 61, 1940, 314. 325 f.

[149] Streitberg, UG 218 *(*dekom)*; Meillet, Caractères³ 224, RES 5, 1925, 178 f., BSL 29/2, 171 f. *(*dekomd)*; Hirt, UG 2, 1932, 111 *(*dekomt)*; Prokosch, CGG 288 *(*dekom)*.

two IE forms for "10", namely **dekm̥* as the cardinal and **dekm̥t* as a collective, will hardly welcome the addition of a variant of either of these forms, namely **dekom* or **dekomt*, of which there is no trace whatsoever outside Germanic. What is more, even within Germanic, the Gothic form is by no means isolated: ON *tíu* clearly represents the same form. And what are we to think of the suggestion that both **dekomd* and **dekm̥d* survive in the same dialect? Meillet was bold enough to assume that OE *tēo* preserved IE **dekm̥t* while OE *tēa* represented **dekomd*[150].

The Germanic data are certainly puzzling. But sound method requires that if Germanic, or rather part of the Germanic area, presents something that is at variance with the evidence of the rest of the IE territory, especially that of the most archaic languages, then the Germanic variation should be regarded as due to secondary alteration. *A priori*, therefore, Brugmann was on the right track when he tried to explain OHG *zehan* as due to other numerals such as *drīzehan* etc.; he thought that the inherited *-un* became *-an* in the weak final syllable of these longer forms[151]. Quite recently Holthausen has suggested that the Gmc. forms in *-an* were due to the analogy of "100" from IE **dkemtóm*[152] but it is impossible to see how the analogy could have produced the desired result; if the analogy occurred when "100" still was **χunðan* in Germanic, its ending might conceivably have led to **teχun* being changed to **teχan*, but in that case why did the new form not become **teχ* just as **χunðan* shed its final sounds? And if the process is so old, why is there no trace of it in Eastern and Northern Germanic?

If the explanation is to be sought along these lines, I would rather suggest that the analogy was due to the decads. There, with the single exception of "20", all decads inherited IE *-kont* which regularly gave Gmc. *-χanþ*: at this stage it was quite possible for the inherited **teχunþ* to be influenced by the series **þrīχanþ *feþurχanþ *femfēχanþ* etc.

But even this solution would take us back so far that it would remain surprising that the analogical influence should only be discoverable in Western Germanic. It is therefore preferable to seek a solution within this area and within this period. Now the Germanic languages, as we have seen, have all evolved a partial inflection of the numerals, the nom-

[150] RES 5, 179, without even specifying what dialect the forms come from. Both are Northumbrian. For their explanation see Sievers-Brunner, Altenglische Grammatik, 1951², § 129 , 2, with Anm. 6.

[151] Grdr.² II 2, 20 f. Kieckers (Handbuch 182) adopts the same line but takes as models the ordinals in *-zehanto* where *-un-* became (through *-n̥-*) *-an-* (?).

[152] KZ 72, 1955, 203.

acc. **teχun*, e. g., acquiring the gen. **teχunō*, dat. **teχunim*. In WGmc., however, the process went even further and a new nom-acc. **teχuni* was formed. On the other hand, in this area medial vowels of varied provenience are reflected by *a*: cp. OHG *metamo* with Goth. *miduma*[153]. It seems therefore probable that **teχunō*, e. g., gave OHG *zehano*, OS *tehano* etc. The new medial *-a-*, arisen in such forms, then spread to the ordinal (*zehanto* etc.) and, of course, to the compounds *drīzehan* etc.

This explanation is supported by a parallel development, again confined to Western Germanic. The IE word **dakru* "tear" was variously transformed in this branch of Germanic. A. S. C. Ross has recently discussed the question and reached the following conclusions[154]:

1. IE **drakuni* became PGmc. **traχuni-*; hence, with artificial suffix-ablaut, also **traχani-*: OHG *trahan*, plur. *trahani*; OS pl. *trahni*, OE **trāni* etc.

2. IE **drakur* became PGmc. **traχuri-*; hence, with artificial suffix-ablaut, also **traχari-*: MHG *traher*, *treher* (OHG **trahiri*).

3. PGmc. **taχuri-*, **taχari-* appear in OHG *zah(h)ar*, pl. *zahari*, *zahiri*.

The facts are, then, that a primitive *-u-* of the second syllable, after Gmc. *-χ-* from IE *-k-*, appears over the whole area as *a*, just as Gmc. **teχun(þ)* appears in this area as **teχan*. It is therefore reasonable to ask whether the change is really due to artificial suffix-variation rather than to a later vowel-change, favoured by the instability of internal vowels under certain circumstances, especially, it would appear, after a Gmc. *-χ-*. In any case, the parallelism within WGmc. between **traχun-/traχan-*, **traχur-/traχar-*, where the original *-u-* does not survive, and **teχun-/teχan-* where the same situation is found, is so clear that the same force must be held accountable for the deviation, whether that is due to suffix-variation or, as I would prefer to think, is phonetic.

Whatever the correct explanation of the forms *zehan-tehan-tēo(tēa)*, it is certain that they do not justify the assumption of a by-form **dekomt* (or **dekomd*) beside the general **dekmt*[155].

[153] Cf. Paul, PBB 6, 1879, 178 – 209, esp. 196 f.; Braune-Helm, Ahd. Gram. 56 – 8. Note also the loan-words *spiagal*, *ziagal*, *zabal*, and see H. Rosenfeld, BzN 9, 1958, 193.

[154] TPS 1954, 87 f., esp. 90; cf. Hamp, PBB (Tübingen) 81, 1960, 263 f.

[155] I should add here that certain ON forms have also led to the suggestion that they reflect a primitive **tehan*, not the normal **tehun*. The set 13 — 19 normally appears as *þrettān — fiǫg(o)rtān fiōrtān — fimtān — sextān — siaut(i)ān — āttiān — nītiān*. The difference between *-tān* (13 — 16) and *-tiān* (17 — 19) is often traced to a primeval difference between PGmc. **tēhan (> *tāhan > tān)* and

We shall therefore view with equal suspicion attempts to prove the existence of a variant with a weakened vowel in the first syllable, i. e. *$d_{e}k\eta t$ or *$d^{o}k\eta t$. For this Arm. *tasn* and the Russian numerals *odinnadcatь* "11", *dvenadcatь* "12" . . . *dvadcatь* "20", *tridcatь* "30" have been invoked. The latter assumption[156] is, however, patently erroneous since, on the one hand, the immediate forerunners, namely (OCS) *jedinъ-na-desęte* "11", *dъva-na-desęte* "12" . . . *dъva deseti* "20", *tri desęte* clearly show the presence of *e* in the first syllable, on the other, the parallel developments in the other Slavic languages also show syncopes, but with varying results: Bulg. *dvádeset* "12" beside *dvájset*, Serbo-Croatian *dvádesēt* — *dvádest-dvaest*, Slovene *dvâjset* etc. The existence of the weakened form is therefore even for Prim. Slav. unprovable[157], let alone for Indo-European.

**tehan (> tiān)*; cf. Noreen, Gesch. der nord. Sprachen, 1913³, 198; R. Loewe, IF 53, 1935, 196. This would imply (dialectal?) IE **dēkom/*dekom*. The Indo-europeanist can only wonder how a Nordic (not even common Germanic) variation in the sets 13 — 16 and 17 — 19 can be traced to a primeval difference of which there is no trace either in the other Germanic dialects or in the other IE languages which all build their sets 11 — 19 (or 13 — 19) on the normal form of "10". This is true even if one is in sympathy with Loewe's view that behind the decimal system we can perceive an earlier quaternary system; for even then **oktō* is the only numeral that shows such a trace.

A slight variation of this view derives *-tān* from *-tēhund*, the morpheme known from Goth. *sibuntehund*; see, e. g., Heusler, Aisl. Elementarbuch, 1950⁴, § 291 Anm. 1; Gutenbrunner, Hist. Laut- und Formenlehre des Aisl., 1951, 128. But here again the basis is unacceptable: we cannot assume that the type in *-tēhund* ever existed in "20 — 60".

For all these reasons it is much more attractive to start from the single form *-tehan*, as was done by Kock, ANF 38, 1922, 136 f.; he accounted for the difference *-tān/tiān* by assuming different accentuation: *sébun-tèhan* > *-tiān* but *þrītèhan* > *-tān*. Rosenfeld (Zahlen 176 f.) assumes that *-tehan* > *tiān*, like *sehan* > *siā* "to see", and *-tān* originated in *siautiān* where the second *i (y)* was dissimilated by the first. Since forms with *-tiān* are found even in the set 13 — 16, this explanation seems to me cogent. But the question is whether *-tehan* is really necessary. Rosenfeld is inclined (176 fn. 4) to assume even for *tīu* "10" this antecedent: expected **tīa* became *tīu* after *nīu*. (But why not **tiā* — **niā*, and even **āttā* — **siā*?). It seems to me that, since the preservation of final *-n* in *-t(i)ān* demands an earlier inflection in any case, we are right in assuming that the vocalism *-iā-* arose as a morphological analogy on the basis of **tiō* from **tehun*; for a parallel one might refer to *hiū/hiōn* ~ *hiā*, see Noreen, Aisl. und Anorw. Gramm., 1923⁴, 279. I see therefore no reason for extending the innovation **tehan* to Nordic.

[156] Fortunatov, KZ 36, 1900, 36; Meillet, MSL 9, 1896, 158, Esquisse² 42; Iljinskij, ASPh 34, 1912, 5; but see Jagić, ASPh 31, 1909, 221.

[157] Vasmer, REW I 330: "unerweislich". See also Berneker, Slavisches Etym. Wb. I, 1913, 187.

As an internal Slavic development it finds a parallel in such late weakenings as Czech *čtyři* in contrast with OCS, Russ. *četyre*; *večerъ* but *v(ъ)čera* etc.[158]

The same is true of Arm. *tasn* although the position there is slightly more complicated, for beside *tasn* "10" we find the form *tasan* in the series "11 — 16": *metasan erkotasan erek'tasan* etc. It is surprising that no one seems to have suggested as yet explaining the difference by deriving *tasn* from **tasunt* (IE **dekomt*), but *tasan* from *tasant* (IE **dekm̥t*). This would be no more fanciful than the similar assumption for Western Germanic, but it would be no less erroneous. It seems rather that while "10" lost the vowel in the final syllable, in the compounds "11 — 19", originally formed with the digit plus "10", the final vowel was retained under the influence of *k'san* "20" where it was legitimate since IE *-m̥ti* gave *-an*. The existence at one stage of *a* in the final syllable of "10" also (*-an* from IE *-m̥t*) is proved by the *a* of the first syllable which is merely due to assimilation and does not represent an IE weakened vowel as maintained by Meillet[159].

Finally, the *-u-* found in such OHG forms as *drī-zug* etc., also sometimes traced to an IE **dḗk* or **dᵒk-*[160], is manifestly a late transformation of the original **tezu-* and need not detain us[161].

*

The only remaining question concerning "10" is the existence or otherwise in Indo-European times of a collective **dekm̥t* "decad". Our investigation of the ordinals has already led to the rejection of such a formation in **dekm̥tos* "10th", and we have also been unable to find support for the assumption that Gmc. **tezu-* is based on such a form rather than on the cardinal **dekm̥t* "10". Since, however, in the individual languages

[158] Cf. Fränkel, IF 41, 1923, 412 f.; A.A. Šaxmatov, Istoričeskaja morfologija russkogo jazyka, Moscow 1957, 145.

[159] Esquisse² 42. — Grammont is basically correct when he assumes (Traité de phonétique, 1956⁵, 265) assimilation of *e-a* to *a-a* in *metasan* etc., and similarly explains *tasn* from the gen. pl. *tasanç* etc. But I do not believe that we can postulate an IE **dekm̥i* for *metasan* etc., in spite of the gen. *metasaniç* etc.; we find the same inflexion in *k'saniç* and the other decads where the *-i-*stem is clearly a late innovation. G. Reichenkron, Festschrift Koschmieder, 1958, 171, explains *tasn* from *metasan* < *metesan* with locatival *-an*.

[160] Streitberg, UG 219; Meillet, Caractères 225, Esquisse² 42.

[161] See already Ch. II, p. 44.

such collectives do exist, we must enquire whether the historical data can throw any light on the Indo-European formations.

Collective numeral formations with a suffix *-t-* or *-ti-* seem to be attested in a fair number of languages, and it will be useful to tabulate them at the outset.

Indo-Aryan has Ved. *pañktí-* "group of five", Class. *pañcát-* "number five"; TS. B. *daśát-*, Class. *daśati(-)* "decad";

Greek makes extensive use of *-άδ-*: μονάς δυάς τριάς . . . δεκάς etc.;

in Albanian the inherited forms of "6 — 10" are replaced by nouns with a suffix *-t-*: *gjashtë* "6", *shtatë* "7", *tetë* "8", *nândë* "9", *dhetë* "10" (and *pesë* "5" ?);

in Italic, Umbrian *puntes* is often interpreted as "quiniones";

in Germanic, Old Norse has the set *fim(m)t sétt siaund étt níund tíund tylft (tylpt)*;

in Balto-Slavic, IE **dekm* is said to have been replaced by **dekmt(i)-*, and in the Slavic set for "5 — 9" we do in fact find *pętь šestь devętь* (but *sedmь osmь*).

This list certainly looks impressive at first sight. But most of the formations are generally admitted to be secondary developments, and it will be as well to make a start with eliminating those elements that cannot contribute to the reconstruction of the Indo-European formations. It will be generally agreed that Albanian, which preserves only fragments of the inherited system, falls within this category, and must, because of the hopeless state of its historical phonology and morphology, be dismissed at once.

As to Italic, the Umbrian word occurs three times only, once in the form *puntis* (Tab. Iguv. III 4) and twice in the form *puntes* (ibid. 9 — 10). Twice the phrase is *urtes puntis* and *urtas puntes*, and this makes it plausible to seek in *puntis* the abl. (or dat. ?) pl., in *puntes* the nom. pl. of an *-i-*stem noun, i. e. *punti-*. The further conclusion that *punti-* represents an earlier **ponkʷ-ti-* is certainly not impossible, but in view of the fact that the whole of the proceedings and the essential terms *(urtes, puntis)* are rather obscure[162] it seems dangerous for the comparatist to operate with an Umbr. *ponti-* "group of five" as if it were an established quantity. On the contrary, in view of the fact that in Oscan we find the numeral adverb *pomtis* "five times" and in Umbrian itself *nuvis* "nine times", it would seem

[162] Contrast with what might be called the unanimous Italian view (Devoto, Pisani, Bottiglioni) the cautious and sceptical statement of Vetter, Handbuch I 211 f. See now Scardigli, SE 25, 1957, 286 f.

preferable to interpret Umbr. *puntis/puntes* as the numeral adverb "five times", with the well-known variation in the spelling of *i*[163]. This would mean that *urta-* is a noun, perhaps simply "group" (connected with *ordō*?), and the passages would have to be reinterpreted as follows:
III 4 : *inuk* : *uhturu* : *urtes* : *puntis* : (5) *frater* : *ustentuta* "tum auctorem ordinibus quinquiens fratres ostendunto";
III 8 : *sakre* : *uvem* : *uhtur* : (9) *teitu* : *puntes* : *terkantur* "hostiam, ouem auctor dicito quinquiens, (fratres? ordines?) inspiciunto";
III 9 : *inumek* : *sakre* / (10) *uvem* : *urtas* : *puntes* : *fratrum* : *upetuta* "tum hostiam, ouem ordines fratrum quinquiens ambiunto". I do not wish to pass over in silence the fact that the position of the numeral adverb in III 10 is somewhat awkward (less so at III 4); but then I find it equally difficult to see why, if *urtas puntes* is a set phrase (as it seems to be at III 4 and III 10), the "adjective" *urtas* should be omitted at III 9[164].

But of all the evidence quoted above it is the Old Norse set that is most impressive — at first sight. Closer inspection reveals that this so-called set is very heterogeneous. To begin with, *tíund* is only found in the sense of "tenth, tithe" and it is obvious that, like the "tithe" words of the other Germanic, and IE, dialects (cf. Lat. *decuma*, Gg. δεκάτη), it is simply the feminine of the old ordinal, i. e. **dekɱtā*[165]. Of the remaining terms, *ætt* is only used in the sense of "plaga caeli, quarter" and its derivation from "8" seems highly doubtful[166]; *fim(m)t* does not mean "a group of five" but only "summons (with a notice of five days)", and *siaund*, although it obviously derives from "7" and thus must have meant "a period or term of seven" (i. e. seven-night?) originally, is only found in the metaphorical sense of "funeral, funeral service (banquet)"[167]; *sétt*, only attested in compounds, means "a body of six", in agreement with *níund* "a body of nine", *tylft (tylpt)* "a body of 12, a dozen".

[163] See Devoto, Tabulae Iguvinae, 1940², 76.

[164] Note however J. Untermann's remark (IF 63, 1958, 189): "Ein *-ti*-Suffix in Osk. *pomtis* "fünfmal" dürfte aus der idg. Zahlwortbildung schwer zu rechtfertigen sein; ebenso unklar ist Umbr. *puntes*".

[165] This is also Rosenfeld's view, Zahlen 172 – 3. — S. Gutenbrunner, Hist. Laut- und Formenlehre des Altisländischen, 1951, 129, would derive this, too, from Gmc. *-iþō-* but the meaning excludes this. The old view is repeated in Steblin-Kamenskij's Drevneislandskij jazyk, 1955, 86 fn. (*tíund* from *-ti-*).

[166] Walde-Pokorny I 105 and Pokorny, IEW 299, trace it to Gmc. **aihti-* "possession". Steblin-Kamenskij, l. c., repeats the old interpretation: "1/8 gorizonta". — The other meaning of *ætt*, "race, family", is no more suitable for derivation from "8".

[167] Is it simply the (old) ordinal (cf. *tíund* above), i. e. "seventh day/night"?

It emerges then that instead of a compact series of collective nouns we find a few nouns so used, but the most significant of them, a collective from "10", is missing. Of equal importance is the observation that, although these nouns are feminine, there is nothing to bear out the conventional assumption that they are *-i*-stems. It will be enough to point out here that, according to Gutenbrunner, these nouns are collectives formed with the Gmc. suffix *-iþō-* (e. g. *fimt* "Fünfzahl" from **fimfiþō* < **femfeþā*)[168] and to add that similar abstract-collectives are found in Baltic: Lithu. *dvetas dvējetas* "pair", *trējetas* "triad", *peñketas* "pentad"; Latvian locativals adverbs of the type *divatā* "in a pair, together", *trejatā četratā piecatā sešatā* "in a group of three, four . . . ; the two of (us) etc."[169]; but also in Skt. *tretā* "triad", *pañcatā* "fivefold amount", without in any way justifying the assumption of such formations for Indo-European. The derivation of the Old Norse collectives is confirmed by *helfþ, helft* "half" which is from **halbeþā*, and not an imaginary **kolb(e)ti-*.

Greater importance attaches to the remaining linguistic groups, especially to Sanskrit and Greek.

Apart from the decads "60 — 90" which, as we have seen, do not belong here, Sanskrit has the collectives *pañktí-* and *daśát(i)-*. The former, attested from the Rig-Veda onwards, differs from Gk. πεντάς, but agrees with OCS *pętь*, and is therefore usually traced to an IE **penkʷti-*[170]. The latter first appears in the Yajur-Veda[171] but only in the form *daśát-*, while the *-i*-stem *daśati-* makes its appearance only in the late Classical period; RV *dáśataya-* does not imply an *-i*-stem but is derived from the only early form *daśát-*[172]. From these facts it follows that there is no justification in Indo-Aryan for the assumption of an IE **dekṃti-* which is often posited on the basis of *daśati-* and OCS *desętь*-[173] with sovereign

[168] Gutenbrunner, l. c.

[169] Cf. Brugmann, Grdr.[2] II 2, 24; Leskien, Litauisches Lesebuch, 1919, 174; Endzelīns, Latviešu valodas gramatika, 1951, 501 f.

[170] Cf. Wackernagel-Debrunner, AiGr. II 2, 641.

[171] See Wackernagel-Debrunner, AiGr. III 418; II 2, 641.

[172] See fn. 10, 11 above. In view of Hitt. *siptamiya-* " a drink (of seven ingredients ?)" (cf. *punch* ?) which seems to derive from IE **septṃ-eyo-* (cf. Sommer, Zw. 23[1]; Kronasser, Handbuch 151 f.; Schwyzer, GG I 590[8]; Wackernagel-Debrunner, AiGr. II 2, 770) with the IE material suffix (Wackernagel-Debrunner, o. c., 213 f.), it seems possible that *dáśataya-* is to be analyzed in the same way: "consisting of ten", with subsequent spread of *-t-aya-*.

[173] Cf., e. g., Berneker, Slavisches Etym. Wb. I 187: "Dem slav. *desętь* entspricht mit lit. alt *dešimti-* (heute *dešimt* indekl.) genau (!) ai. *daśati-* . . . , aisl. *tíund* "Zehnheit" (!)". Cf. against this, Wackernagel-Debrunner II 2, 641: "Übereinstimmung . . . ist zufällig".

neglect for the chronological sequence apparent in both languages. For even on the Slavic side the evidence clearly shows that the primitive, inherited form was *deseṭ-* not *deseṭь-*: the consonantal stem is found in the loc. *deseṭ-e* (in 11 — 19: *jedinъ na deseṭe* "11" etc.), in the nom. pl. *deseṭ-e*, the gen. pl. *deseṭ-ъ*[174], and is confirmed by Baltic where Old Lithuanian and modern Lithuanian dialects show *-t* in *dešimt*[175]. Thus the only form that has claim to an IE date is **dekṃt*, represented not only by the Vedic and Balto-Slav forms quoted but also by Gk. δεκάς[176]; the latter is not based on an IE **dekṃd* but is a transformation of the inherited **dekṃt* as was shown earlier[177].

It seems much more doubtful whether we can acknowledge the existence of a collective **penkʷti-* in Indo-European. In the first place, the divergence between Ved. *pañkti-* and Gk. πεντάς is much greater than it seems on the surface. The difference is not merely that accompanying a secondary refashioning, it is much more fundamental. The fact that Homer's πεμπάσσεται assures the existence of an earlier πεμπάς and that Ionic and Attic πεμπάς also demands for the coinage a date preceding the divergent development of the labiovelars, combine to prove that **penkʷad-* cannot be later than the end of the Mycenaean period when, as the Linear B tablets have revealed, the labiovelars had already begun their metamorphosis and, according to some scholars, before *a* had already developed into labials. On the other hand, the very fact that there is no suitable suffix to explain the formation, makes it quite clear that πεμπάς, or rather **penkʷad-*, was formed after δεκαδ-[178] and thus there can be no connection between Gk. πεμπάς and Ved. *pañkti-*.

Nevertheless the general view seems to be that Ved. *pañkti-* is to be traced to an IE **penkʷti-*, also reflected by OCS *pęťь*[179]. The fact that in that case the collective of "5" would be a *-ti*-stem, while that of "10" is

[174] See Leskien, Handbuch der altbulg. Sprache, 1922⁶, 94; Vondrák, Vergl. Slav. Gram. II, 1928², 66 f.; Diels, Altkirchenslav. Gram. I, 1932, 216 f.; Vaillant, Manuel du vieux slave I, 1948, 153; Vasmer, REW I 347.

[175] See the recent emphatic statement by Mažiulis, Voprosy Jazykoznanija, 1956/4, 57.

[176] Sommer, Zw. 18.

[177] See above, Ch. II, p. 30 f.

[178] After these two basic nouns the other collective numerals in *-άς* were formed. Cf. Sommer, Zw. 19 f., and now also K. Strunk, Die sog. Äolismen der homer. Sprache, 1957, 35 fn. 73.

[179] See, e. g., Wackernagel-Debrunner, AiGr. II 2, 641; Trautmann, Baltisch-Slavisches Wb. 213 f. (: B-S **penkti-* = Skt. *pañkti-*); Sommer, Zw. 19¹: *pañkti-* "im Suffix älter als πεμπάς, vgl. abg. *pęťь*"; Vasmer, REW II 479.

a *-t*-stem, is generally ignored by comparatists, although it is very strange that such a difference should exist, considering that "5" and "10" are so closely connected within the numerical system, both from the mathematical and the linguistic point of view. It is also surprising that while Slavic is supposed to have preserved such abstracts as **penkʷti- *s(w)eksti-* and **newn̥ti-*, Baltic has no trace of these formations at all.

Not that Baltic preserved the Indo-European heritage in its entirety. The group "7 — 9" in particular shows considerable transformations. The modern forms: Lithu. *septynì* "7", *aštuonì* "8", *devynì* "9"; Latvian *septiņi astoņi deviņi* are sufficient to show this. It is also clear that these forms represent the final result of a development through several stages[180]. At the beginning, before the more radical transformations, we have Primitive Baltic **septin*, **aštō* and **nevin* (or already **devin*), from IE **septm̥*, **oktō* and **newn̥*. In the next phase the final vowels of "7" and "9" were lengthened after that of "8", resulting in **septīn *nevīn*, and perhaps already **aštōn*, with *-n* adopted from "7" and "9". Finally, the inflexion of (Lithu.) *keturì* masc., *kẽturios* fem. was extended to "5 — 9" and we have (Lithu.) *penkì peñkios, šešì šẽšios*; *septynì, septýnios*; *aštuonì, aštúonios*; *devynì, devýnios*.

These changes are certainly not negligible. But they are a far cry from what we find in Slavic. For those who consider a period of Balto-Slavic unity an inescapable linguistic and historical reality[181], this should have been a sufficient warning against the rash assumption of an uninterrupted continuity between a primeval **penkʷti-s* and (OCS) *pętь*. But even those who are not convinced of the historical necessity of Balto-Slav unity[182] should have asked themselves how it is possible that the alleged *-ti-* suffix appears in "5", "6" and "9" only, whereas "7" and "8", though far from representing the IE forms, show no sign of it. For the observation of this discrepancy within Slavic holds the key to a proper understanding of the changes that brought about the characteristic Slavic system.

The process is at its clearest in "7" and "8", which appear as Prim.

[180] Cf. Brugmann, Grdr.² II 2, 18; Endzelīns, Latviešu valodas gramatika 489 f.

[181] I may refer the reader to my recent survey of the question in Kratylos 2, 1957, 97 – 123.

[182] It will be enough to mention here W. K. Matthews' paper on "The interrelations of Baltic and Slavonic" in Slavonic Review 35, 1957, 409 – 427, which was too late for inclusion in my own survey. I cannot agree with the completely negative views advanced in this paper.

Sl. **sedmъ* and **osmъ*[183]. In the case of "7", it is generally agreed that PSlav. **setь*, the regular development from IE **septṃ*, was "influenced" by the ordinal **sedmъ*. More precisely, it is contended that **sedmь* has nothing to do with the expected **setь*, but is, in its entirety, based on the ordinal **sedmъ*, on which it was built after the pattern of *pętь* : *pętъ*, *šestь* : *šestъ*. Similarly, **osmь* is based on **osmъ* "8th", and is formed after *šestь* : *šestъ*, *devętь* : *devętъ*. All this is perfectly possible *if*, but only if, the existence of the models can be taken for granted, and it is taken for granted too easily, without any proof. The only real fact is that in "7" and "8" cardinal and ordinal have influenced each other, and "7" influenced "8". The latter statement is evident since PSlav. **ostovъ*, from IE **oktowos*, was manifestly transformed after **sedmъ* to **osmъ*. Since we have seen that **sedmъ* itself is not derived from an IE **sebdmos* but represents a fairly late Slavic refashioning of the inherited **septṃmos*[184], we can even go further and state that **oktowos* was at an early stage remodelled to **oktṃmos* from which **os(t)mъ*. That both changes occurred fairly early is proved by the fact that in the earlier periods of the Baltic languages we find the same transformations: Old Prussian has the ordinals *septmas asmas*, Old Lithuanian the corresponding forms *sẽkmas ãšmas*[185]. At an early stage, then, both in Baltic and Slavic, or, as I would say, in Balto-Slavic, there existed the cardinals **septin *oštō* and the ordinals **septmos *oštmos*[186]. But while in Baltic the two types of numerals did not further encroach on each other — in point of fact Baltic later elim - nated the anomalous ordinals, replacing them by the regularized *septintas *aštōntas* — in Slavic the lines were crossed. This important step resulted in the inherited **setь* and **sedmъ* producing the conflated cardinal **sedmь*, without any help from the (as yet) non-existent pairs *pętь* : *pętъ*, *šestь* :

[183] The most recent discussion is to be found in Vasmer, REW II 608 (*semь*), 602 *(sedьmoj)*, and I 231 – 2 *(vosemь, vosьmoj)*.

[184] See Ch. I, p. 6 f.

[185] OLithu. *sẽkmas*, if from **se(p)tmas*, not **sep(t)mas* (e. g. Mikkola, Urslav. Gram. III, 1950, 57), shows not only the change of *t* to *k* before a following sonant as is also found in the suffix *-kla-* from IE *-tlo-*, but also the retention of the voiceless character in contrast to Slavic which changed *-tm-* to *-dm-* just as it evolved *-dlo-* from the inherited *-tlo-*.

[186] The Slavic development from **septmos *oktowos* to **sedmъ *os(t)mъ* finds an interesting parallel in Old French. There Lat. *septimum/septima* developed into (the dialect variants) *setme sietme sedme* (!), while *octāvus* was transformed into *octimus* (!) resulting in *oitme oidme oime*; cf. Nyrop, Gramm. hist. de la langue française 2, 1924², 366 f.; M. Pope, From Latin to Modern French, 1956, 318 f.; É. Bourciez, Éléments de linguistique romane, 1946⁴, 237.

šestъ. The emergence of the pair **sedmъ* : **sedmъ* then led to the replacement of the inherited **osta* "8" by the new **osmъ*[187].

If then the creation of the *-i*-stems **sedmъ* **osmъ* does not require the help of pre-existing *-ti*-stems in the preceding and following cardinals, we may rightly doubt whether these stems existed at all. A confrontation of the IE formations and their regular developments will show that the assumption is quite unnecessary. The expected picture is as follows:

	IE	Sl.		IE	Sl.
"5"	**penkʷe* >	**pęče*	"5th"	**penkʷtos* >	**pętъ*
"6"	**(k)seks*	**še*	"6th"	**(k)sekstos*	**šestъ*
"7"	**septṃ*	**setь*	"7th"	**septṇmos*	**setmъ*
"8"	**oktō*	**osta*	"8th"	**oktowos*	**ostovъ*
"9"	**newṇ*	**devь*	"9th"	**newṇnos*	**nūnъ (njūnъ ?)*
"10"	**dekṃt*	**desę(t)*[188]	"10th"	**dekṃtos*	**desętъ*.

It is clear that the unchecked phonetic development would have brought the system to the brink of complete disintegration. In the new Slavic set the cardinals "5 — 9" have lost all resemblance to the corresponding ordinals, although the pattern was in general fairly simple and clear, especially in *četyre* : *četvŕtъ* and *desę(t)* : *desętъ*. But the beginnings of a new coherent system were present after the changes in "7 — 8" and "7th — 8th", discussed above, had taken place. The new picture can be illustrated by the following diagram:

"5"	**pęče*	"5th"	*pętъ*
"6"	**še*	"6th"	*šestъ*
"7"	**sedmь*	"7th"	*sedmъ*
"8"	**osmь*	"8th"	*osmъ*
"9"	**devь*	"9th"	**nūnъ (njūnъ ?)*
"10"	**desę*	"10th"	*desętъ*

In this new set, in "7 — 8" at least, a clear pattern was discernible: the only difference between cardinal and ordinal was that the former attached *-ь*, the latter *-ъ* to the same "stem". Accordingly **še/šestъ* was remodelled to **šest-ь/šest-ъ* and after it **pęče/pętъ* to **pęt-ь/pęt-ъ*. The wide gap in "9" was also eliminated: after the pattern of "10th", "9th"

[187] It is, of course, possible, perhaps even probable, that **osta*, flanked by **setь* and **devь*, first changed to **ostь* from which the transformation to **os(t)mь* was even easier.

[188] I accept the conventional **desę(t)*, although in my view the phonetic development was **desь*; cf. Ch. III, p. 64 f.

was refashioned to **devętъ* and the combined pressure of the compact group "5 — 8" produced the new cardinal **devęt-ъ*.

It will be seen that this explanation gives a satisfactory account of the very fact that remained completely obscure in the old theory, to wit that "7" and "8" show no sign of the alleged collective suffix *-ti-* which with curious inconsistency only picked the numbers "5", "6" and "9". It is also proved that Slavic *pętь*, far from being the descendant of an IE **penkʷti-*, is the final product of a series of analogical transformations within a limited set of closely linked numerals.

It may be asked how it is that "5 — 9" are *-i*-stems, while "10" is not, especially as we assumed that "10" influenced "9" to a considerable extent. The answer is that in Slavic "10" itself is an *-i*-stem. Above, we have emphasized that Slav *desętь* is not an inherited *-ti*-stem, as is clearly shown by such consonantal cases as loc. sg. *deset-e*, nom. pl. *deset-e*, gen. pl. *deset-ъ* .But we must not lose sight of the fact that these cases are merely a survival from an earlier phase. In normal use, "10" is an *-i*-stem, just as the cardinals "5 — 9" are.

This transformation of the inherited consonant-stem **dekmt* is at first sight surprising. But it is easily explained within its context. IE **dekmt* resulted in **desę*, or rather **desь*, while in the oblique cases there were acc. *desętь* from **dekmt-m*, gen. *deset-e* from **dekmt-es* etc. No wonder that the nom. was replaced by the acc. *desętь*[189]; in **sedmь*, and after it **osmь*, and later also **šestь* **pętь* and **devętь*, the final *-ь* was also based on the regular development from IE *-m* in **septm*. Thus, without the help of an IE suffix *-ti-*, the numerals "5 — 10" evolved, partly at any rate, forms which looked as if they had been identical with the descendants of the IE *(t)i*-class. This "accident" had the consequence that this set of numerals was drawn into the only suitable and living inflectional category, that of the *-ti*-stems. This whole line of development was set off by "10" which from IE times had an ambivalent use: it could accompany its noun as an uninflected adjective or else govern it (with the dependent noun in the genitive) as an inflected noun. This twofold usage provides indeed the explanation for the existence in various languages of separate forms for the cardinal "10" and the collective "10": both represent the same basic word **dekmt*, the cardinal in its use as an uninflected adjective, the collective as an inflected noun, but in areas where the uninflected form lost its final *-t* under certain sandhi-conditions, the form **dekm* split off as a separate form, leaving a clearly distinguished abstract-

[189] Cf. also IE **nokʷt-*, **pont-* which appear as *-i*-stems in Slavic.

collective (Aryan, Greek). In Slavic the new cardinals in *-(t)ъ*, placed between the fully inflected "1 — 4" and the inflected "10" also adopted the full inflection — according to the only possible inflectional pattern, the *-(t)i*-stems. The inflection of the cardinals as nouns entailed their syntactic use as nouns, the government of the dependent noun in the genitive, supported by the existing nominal use in "10". This agreement in the syntax had a further repercussion in morphology: since the newcomers were accommodated by the only living category, the *-(t)i*-stems, their pressure transferred **desętь* from the earlier consonantal inflection to the same class, and in historical times, in the earliest OCS records, the consonantal stem only survives in forms and usages which had been coined before the creation of the *-(t)i*-stem forms of "5 — 9".

If this explanation is correct, Skt. *pañkti-* is left without any correspondence in the cognate languages. ON *fimt*, Umbr. *pontis*, Slavic *pętь* have all turned out to be unreliable witnesses of an IE **penkʷti-*, the existence of which is also rendered rather precarious by the fact that it would be the only nominal formation in *-ti-* within the numeral system. But it would be equally difficult to find a reasonable explanation for *pañkti-* as an innovation at any point along the line from Indo-European to Early Vedic. In these circumstances, connection with some IE formation must be considered very probable, and the only one that presents itself to the inquirer is the following.

OCS *pęstь* "fist" (ORuss. *pjastь* "fist", Serb. *pȅst* "fist" etc.) is cognate with OHG *fūst*, Mod. Germ. *Faust*, OE *fýst*, Mod. Engl. *fist*. The Germanic forms demand a PGmc. **funhsti-*[190], with which Slav *pęstь*, from an earlier **pn̥(k)sti-*, is in full accord, the combined evidence pointing to an IE **pn̥k(ʷ)sti-*. De Saussure was also right in adding[191] to this group Lithu. *kùmštis* "fist"[192] as deriving by metathesis from an earlier **punkstis*[193]. The word **pn̥kʷstis* is connected by many scholars with the root of **penkʷe* "5" on the assumption that the numeral "5" evolved from the

[190] Walde's **pn̥sti-* (WP II 84) cannot account for the loss of the nasal in OHG. De Saussure drew the correct conclusion at MSL 7, 1892, 93; cf. also Trautmann, Baltisch-Slavisches Wb. 218; Pokorny, IEW 839; Vasmer, REW II 477. It is surprising to find **pn̥sti-* accepted by a Germanist of Rosenfeld's standing (Zahlen 208 fn. 79).

[191] Saussure, l. c. Cf. also Vondrák, Vergl. Slav. Gramm. I 361, 647.

[192] The Lithu. form is usually quoted as *kúmstė*; there are *kùmštis*, *kùmščia* and *kùmstė*, *kùmštė*.

[193] This is very likely borrowed from Germanic. Walde's connection (l. c.) *kumpas* "krumm" is hardly "einleuchtend".

earlier concrete meaning "fist, hand". If this explanation is correct, we may assume that both meanings were present in the IE word. Furthermore, since the *-ti*-stems originally showed variation between full and nil grade in the stem-syllable[194], the original inflection was nom. **penk^{w}-sti-s*: gen. **pn̥k^{w}stei-s* etc. If these assumptions are correct, Ved. *pañkti-* becomes clear: it represents IE **penk^{w}sti-* "fist, (group of) five", with regular loss of *-s-* between stops, and not **penk^{w}ti-*, a derivative of the cardinal **penk^{w}e*.

[194] Cf. Pedersen, Études Lituaniennes, 1933, 21 f.; Schwyzer, GG I 504 f.; Szemerényi, Die idg. Liquidae Sonantes im Lateinischen, Budapest 1941, 23 f., esp. 26.

CHAPTER V

The nature of the IE decad-formations

The previous chapters have shown that the first part of the decads contained the forms **wī- *trī- *kʷetwṝ- *penkʷē- *sweks- *septṃ̄- *oktō-* (or **oktou-*) **newṇ̄-*. We have also seen that the second part is based on the cardinal "10" whose only IE form was **dekṃt*, earlier (PIE) **dekemt/dekomt*. It is now time to examine the structure of these compounds.

Of all the IE languages, Greek seems to preserve the clearest pattern. "20" points to IE **wīkṃtǐ*, while the other decads have -κοντα. The former is generally considered to contain a dual form **(d)kṃt-ǐ* of **dekomt-*, while -κοντα would be a neuter plural **(d)komt-ə*. This interpretation is usually supported with the observation that the first part of τριᾰ́-κοντα τετταρᾰ́-κοντα also presents a neuter plural form of the corresponding digits. Furthermore, Lat. *-gintā* "clearly" shows the ntr. plur. ending *-ā*.

By the side of the Graeco-Latin "neuter" type, Aryan offers formations which cannot be reconciled with this interpretation. To be sure, Skt. *catvāriṁśat* would, at first sight, favour the view that *catvāri* is the ntr. plur. of the digit; but *-śat* cannot be regarded as continuing IE **komtə* or even **kṃtə* which would have resulted in *-śanti* or *-śati*[1]. The same is proved by *pañcāśat* which, *prima facie*, points to **penkʷēkṃt*, but certainly not to **penkʷēkomtə* or **penkʷēkṃtə*, required by the neuter plural theory.

The difference between these two types has led to the suggestion that the two groups preserve two very different principles employed in the formation of the decads. According to Brugmann[2], one type had the morpheme **komt-* in the ntr. plur. form **komtə* (the dual **kṃt-i* in "20"), preceded by the cardinal which, as an adjective, was, when possible, in-

[1] The fairly frequent view that neuters originally did not differentiate between singular and plural (Wackernagel-Debrunner, AiGr. III 65) so that the element *-śat* could be an original neuter plural (Meillet, MSL 17, 1912, 291; Burrow, Sanskrit 260), cannot be upheld; see Kuiper, Shortening of final vowels in the Rigveda, 1955, 12 f., esp. 16 f.

[2] Grdr.[2] II 2, 30 f. (the form **kmtə*, p. 30, must be a misprint for **komtə*). This view originated with J. Schmidt, see Pluralbildungen der idg. Neutra, 1889, 294 f.

flected before it: type τριᾰ́-κοντα. The other type was a fem. sg. compound-abstract with **komt/kmt-*, in which, quite naturally, the digit was not inflected: type τριᾱκάς. But the τριᾰ́κοντα type became indeclinable in Indo-European itself, the second member losing its inflexion just as the first member did in "20 — 40" where it had been inflected. Moreover, the two types were fused at an early date: τριᾱκάς (instead of *τρι-κάς) has its *-ᾱ-* from τριᾰ́κοντα.

This interpretation of the so-called τριᾰ́κοντα type, generally accepted today[3], receives only very slender support from the facts. The alleged inflection admittedly appears nowhere. Its only trace would be the ntr. plur. form *trī(gintā)* τριᾰ́(κοντα). The assumption that historical τετταράκοντα "still" reflects the consciousness of the speakers of -κοντα being a ntr. plur. form, cannot be said to be cogent, since the transformation of the original form (*τετρᾱ- from **kʷetwr̥-*) to τετταρα- may, to say the least, just as well reflect a new interpretation as a ntr. plur. of the element -κοντα.

It is quite clear that, but for Gk. τριᾰ́κοντα and τετταράκοντα, and the Latin type in *-gintā*, no one would have thought of interpreting the decads in these languages as representing phrases consisting of the inflected forms of the digits and a neuter **(d)komt-*. The very fact that, as far as can be ascertained, all the other languages present formations with a singular noun **(d)komt-*, speaks against the neuter plural theory. It is equally plain that the theory of twofold formations — inflected neuter plurals and singular collectives — was only devised to resolve the apparent difficulty of reconciling the divergences in the second member. For we must not lose sight of the fact that there is no divergence in the first members: all over the IE territory we find the same forms **trī- *kʷetwr̥- *penkʷē-* etc., whether the second member be a "singular feminine" or a "neuter plural".

In these circumstances, it is of prime importance to clarify the character of the second member in the various languages. Our earlier results (Ch. IV) concerning **dekmt* will have to be borne in mind: **dekmt* is not an abstract, different and formed from **dekm*, but *the* primary form of the cardinal "10".

In the Celtic languages, the decads inflect as masc. singular nouns. The position is quite clear in Old Irish where *trícho (trícha)* "30", *cethorcho* "40" etc. inflect according to the paradigm of the stems in *-t* (= [*d*] from

[3] Cf., e. g., Wackernagel-Debrunner, AiGr. III 368; Schwyzer, GG I 592; most recently, Rosenfeld, Zahlen 182 A.

-nt-)[4] and thus present the inflexion *-kont-s/kont-n̥* etc. The scanty traces in the British group (OW. *trycwn, pymwnt*[5], and Bret. *tregont*) agree with this picture inasmuch as their *-kont* is from the oblique cases (acc. *-kont-an* etc.)[6]. There is some difference between the two groups in the treatment of "20". The British dialects preserve the ending *-kn̥tī* (W. *ugain* etc.), but in Old Irish even this form is drawn into the orbit of normally inflected nouns and appears as *fiche*, gen. *fichet*, acc. dat. *fichit* etc. This is particularly important because it reveals the influence of the inflected set "30 — 90". The purely phonetic development of IE **wikn̥tī* would have been OIr. **fichit* (with *-t* = [*d*]), in accord with *birit* "sow" from **bherɣtī, ethait* "bird" from **petontī* etc., and especially *Brigit* from Pre-Irish **brigentī*, IE **bhr̥ghn̥tī*[7]. It is quite clear that the Old Irish inflected paradigm *fiche/fichet/fichit* is based on the regularly developed **fichit* which was forced by the pressure of "30 — 90" to adopt their pattern and did so by assuming the inflection indicated by its form and by the fact that "30 — 90" belonged to the *-d*-stem class. It is therefore wrong to say that, in contrast to British, Irish "20" belongs with the group of abstract-collective compounds[8]; a Pre-Irish **wīkn̥t-s* never existed.

Another area in which the decads are inflected as if they were *-nt*-stem singular nouns is said to be Iranian. In point of fact, Iranian scholars have advanced and comparatists have unquestioningly accepted the following propositions[9]:

1. Avestan preserves the feminine nouns *θrisąs* "30" and *vīsąs* "20", from IE *-kont-s*;

2. Inflected forms of the same type, stereotyped in the acc., are represented by *θrisatəm* "30", *čaθwarəsatəm* "40", *pančasatəm* "50".

Both propositions are important enough — both from the Aryan and the Indo-European point of view — to merit a careful examination.

The form *θrisąs* occurs once only as a nominative, at Yasna 1. 10: *nivaēδayemi hankārayemi vīspaēibyō aēibyō ratubyō yōi hənti ašahe ratavō θrayasča θrisąsča nazdišta pairiš. hāvanayō* "ich widme (es), ich vollziehe (es), für alle die Ratus, die die 33 nächsten mit Hāvani sich einfinden-

[4] Cf. Thurneysen, GOI 207; Lewis-Pedersen, Concise Compar. Celtic Grammar 176.

[5] See Ch. I fn. 106.

[6] Bret. *tregont* cannot reflect a plural **tri-komt-es* as suggested by Pokorny, IEW 192.

[7] See Vendryès, Corolla linguistica — Festschrift Sommer, 1955, 229 f.; Pokorny, ZCP 26, 1957, 309. 315 f.

[8] Pedersen, VKG II 129.

[9] Bartholomae, Grdr. I 111; Brugmann, Grdr.[2] II 2, 31. 34; Meillet, Introduction[8] 413.

den Ratus des Aša sind"[10]. The same form occurs twice more, but used as an instrumental, in Chapter XIV of the Vidēvdāt, in a list of 12 Iranian weapons (14. 9): *puxδəm zaēnāuš maṭ akana maṭ θrisąs ayō.aγrāiš, xštvī fradaxšana snāvarə.bāzura maṭ θrisąs fradaxšainyāiš* "als fünftes der Wehrgehänge mit dem Köcher samt 30 eisenspitzigen (Pfeilen), als sechstes die Schleuder, (deren) Arme von Sehnen gebildet (werden), samt 30 Schleudersteinen"[11].

However, beside these forms we find a much greater number of passages where the form *θrisatəm* is used either as a nom. (? Āfrīnakān 3. 10; Frahang ī oīm 23[12]), or as an acc. (*θrisatəm aiwi.gāmanąm* "for 30 years", Yt. 19. 29; *θrisatəm upāzananąm* "30 strokes", Yt. 10. 122; V. 4. 19 bis, 6. 11 bis; *θrisatəm ātrə.saokanąm* "30 firebrands", V. 12. 1 etc. [four times][13]; *θrisatəm frasčinbananąm* "30 planks", V. 18. 74). Derivatives are based on *θrisat-*: *θrisaθ-want-* "thirty-fold" (Yt. 10. 116), *θrisastəma-* "30th" (? ? N. 51[14]); or on the thematized *θrisata-* (indistinguishable from *θrisata-* "300"): *θrisata-gāya-* "(a distance of) 30 paces" (: ntr. acc. *-gāim*, V. 3. 17 ter; 17. 4), and the adverbial ntr. acc. sg. *θrisataθwəm* "30 times" (V. 8. 98 bis).

In "40 — 50" a formation corresponding to *θrisąs* is unknown. Only *čaθwarəsat* and *pančāsat* occur, in the following forms and derivatives. The form *čaθwarəsatəm* is twice used as the nom. (Yt. 19. 7: *čaθwarasča aθa garayō . . . čaθwarəsatəmča* "four hills and forty"; Āfrīnakān 3. 7: *pančāča čaθwarəsatəmča* "45"), five times as an acc. (V. 2. 41: *čaθwarəsatəm aiwi.gāmanąm* "40 years"; 8. 93: *čaθwarəsatəm ātrə.saokanąm . . . ava. baraiti* "brings 40 fire-brands"; 12. 13: *čaθwarəsatəm* "40 [days]"; Y. 65. 4: *čaθwarəsatəm ayarə.baranąm* "40 days' ride"; Vd. 19: *čaθwarəsatəm*)[15].

For "50" the form *pančāsatəm* is used as a nom. at V. 5. 27 (*panča vā*

[10] F. Wolff, Avesta, 1924, 6.

[11] Wolff 406. — On *bāzura-* see now Benveniste, Asiatica — Festschrift Weller, 1954, 33 – 4.

[12] Reichelt, WZKM 14, 1900, 205.

[13] The construction is ungrammatical or at least elliptical throughout this chapter. E. g., V. 12.1: if a father dies or a mother dies, *čvaṭ aēšąm upa.mąnayąn* „quantum (temporis) eorum (causa) maneant (sc. in luctu) ?" The answer is: *θrisatəm dahmanąm xšvaštīm tanu.pərəθanąm* "triginta (sc. dies) . . . sexaginta [*accus.*]. . ."; see AiWb. 1124 f.

[14] This form, emended by Bartholomae (AiWb. 810) from the "manuscript-reading" *θrəstəməmčaṭ*, is highly dubious; I can find no trace of it in Waag's edition.

[15] In IF 12, 1901, 100, Bartholomae gives the text as: *pasča čaθwārəstəmča ayaranąmča.*

pančāsatəm vā satəm vā) but as the acc. at ten other passages (Yt. 8. 11: *aēvąm vā avi xšapanəm duyē vā pančāsatəm vā [satəm vā]* "for one night or two or fifty [or a hundred]"; V. 7. 48: *pasča pančāsatəm sarəδąm* "after fifty years"; V. 8. 92: *pančāsatəm ātrə.saokanąm* "50 fire-brands"; V. 4. 19 bis, 6. 13 bis: *pančāsatəm upāzananąm* "50 strokes ";*pančăsatəm* V. 12. 9,11; F. 10[16]).

Of "40" no other case-form is found, but of "50", inflected as an adjective, the instr. plur. occurs in the Vispered (8. 1): *haθra vanubiš yazataēibyō . . . pančasaṭbišča satāišča hazanrāišča* "together with the good yazatas . . . 50, 100, 1000 . . . in number".

The stem-form is used in the derivatives *čaθwarəsaθ-want-* "forty-fold" and *pančasaθ-want-* "fifty-fold" (Yt. 10. 116). From "50" a curious compound *pančasaγnāi*, a final dative of a neuter noun **pančasa-γna-* "killing of fifty"[17], appears twice (Yt. 8. 61; V. 7. 53)[18]. In addition, the ordinal *čaθwarəsata-* "40th" is obtained by emendation[19], and from "50" there is *pančāsata.gāya-* "(a distance of) 50 paces" (V. 17. 4) and *pančā. sadvarā* "der 50 Tore hat (?)"[20].

The series "60 — 70" is, of course, of no help since the original forms have been transformed into *xšvašti- haptāiti- aštāiti- navaiti-*, with the corresponding adjectives *xšvašti-vant-* "60-fold", *haptaiθi-vant- aštaiθi-vant-*[21] *navati-vant-* (these all once each, at Yt. 10. 116).

More interesting is "20". The normal form, agreeing with that of the other IE languages, including Indo-Aryan, has the ending *-ti*: *vīsaiti upāzananąm* "20 strokes" (acc., Yt. 10. 122), *vīsaiti ātrə.saokanąm* "20 fire-brands" (acc., V. 8. 95), *pančāča vīsaitiča* (acc., V. 12. 9, 11); *vīsaiti* (V. 12. 13, 17). It is also found in the derivative *vīsaiti-vant-* "20-fold" at Yt. 10. 116, together with all the other numeral derivatives in *-vant-*.

[16] Reichelt, WZKM 14, 1900, 200.

[17] Cf. Benveniste, Les infinitifs avestiques, 1935, 41; Duchesne-Guillemin, Les composés de l'Avesta, 1936, 64. 218.

[18] Unless the corruption goes deeper than a mere refashioning of the expected **pancasaδγnāi*. It is worth noting that the gradation is: for the killing of 50 with 100 murders (strokes ?); 100 — 1,000; 1,000 — 10,000; 10,000 — 100,000. This would certainly seem to point to **dasaγna-* not *pancasaγna-*, or at least to the latter being influenced by the former. See now also Gershevitch, The Avestan Hymn to Mithra, 1959, 325.

[19] At Nirangistan 65, according to AiWb. 578: *čaθwarəsatəm gaošəm frāyazāmaide*. But again there is no trace of the word in Waag's edition.

[20] But note Wüst, ARW 36, 1940, 254 ff.: Skt. *śadvalā* (M.).

[21] The *θ* in *haptaiθivant-aštaiθivant-* must be analogical, cf. *haptaθa-*. It can hardly attest an earlier **haptaθ-vant-* from **haptat-*; see above, p. 88.

But a nominative, used as an adjective, appears at Yt. 1. 19, where Bartholomae reads: *+vīsąs +tāča imå nāmānīš* "and these 20 names"[22]. The ordinal "20th", found only once, in the same Yašt (1. 8), appears in the form *vīsąstəma-*. Finally, the dvigu-compound *vīsata. gāim* "(a distance of) 20 paces" (V. 17. 4) should be mentioned.

From this survey the following facts emerge. For "20 — 50" the usual forms are *vīsaiti* (6 x + *vīsaiti-vant-*), *θrisatəm* (14 x), *čaθwarəsatəm* (7 x), *pančāsatəm* (11 x). "20" agrees with the general IE form, but "30 — 50" have no parallels except for Indo-Aryan where however the forms in *-śatam* are accusatives of the normal forms in *-śat*. But even in Avestan there are traces of the Indo-Aryan formation: *θrisat-* and *čaθwarəsat-* are presupposed by the derivatives in *-want-*, while *pančāsat-* is the basis of the corresponding *pančasaθwant-* and also appears in the instr. *pančasaṭbiš* and in the falsely divided *pančā.sadvarā* = *pančāsat-dvarā*.

In addition to these formations we have the unique nom. *vīsąs* (obtained by emendation!), agreeing with the ordinal *vīsąstəmō*, and the "nominative" *θrisąs*, twice used as an intrumental. These nominatives have been taken at their face-value and regarded as reflecting IE collective formations in *-kont-s*. It is also assumed that the normal forms of "30 — 50" in *-satəm* present the same formation in the acc.: nom. *-san(t)-s*, acc. *-sa(n)t-am*.

This explanation is rather surprising since in Indo-Aryan we find nothing corresponding to the assumed Iranian inflection. Even within Iranian, in particular in Avestan, the inflection as posited would be unique: the acc. ought to be *-santəm*, not *-satəm*. It is therefore usually assumed that the transformation of *-santəm* to *-satəm* was "helped" by the numeral *satəm* "100". But once such an influence is admitted, the question arises whether this analogical influence is not the whole explanation of the ending *-satəm*? In other words, it is just as possible that the original forms were *θrisat čaθwarəsat pančāsat* which, under the influence of *satəm*, without the existence of an inflection *-sants/santam*, became *θrisatəm čaθwarəsatəm pančāsatəm*.

Such analogical influence is especially easy to understand if we observe that the numerals in *-satəm* all occur in the Later Avesta. By that time the living language must have at least begun to shed the ending *-at* in the original forms in *-sat*, and the discrepancy between spoken **θrīs *čaθwars *pančās* and literary *θrisat čaθwarəsat pančāsat* must have created a

[22] AiWb. 1458.

favourable setting for the pseudoarchaic forms *θrisatəm* etc.[23] It is worth pointing to such sequences as *panča vā pančāsatəm vā satəm vā* (V. 5. 27), *pančasatəm vā satəm vā* (Yt. 8. 11), which suggest that it was "50" that was first influenced by "100", the analogical ending then spreading down the scale. The same analogical influence is also responsible for the "thematized" formations with *-sata-* instead of *-sat-*, e. g. *pančāsata.gāim*. This becomes clear when we observe that this formation is part of a whole set of the same type: *θrigāim — xšvaš.gāim — nava.gāim — dasa.gāim — panča.dasa.gāim — vīsata.gāim — θrisata.gāim — pančāsata.gāim*[24]. As can be seen, from "9" onwards all have *-a-* before the second member *-gāim*, in contrast to the obviously more archaic set *vīsaiti-vant- θrisaθ-want- čaθwarəsaθ-want- pančasaθ-want-* etc. Here again it is obvious that *vīsata.gāim*, e. g., must be due to the analogy of other compounds, possibly *dasa.gāim panča.dasa.gāim*, and probably the set *pančāsata.gāim *čaθwarəsata.gāim θrisata.gāim*, this set itself starting with *pančāsata. gāim* formed after **sata. gāim*. This explanation disposes of the inflected abstract-collectives in *-sant-* which are otherwise without support in the Aryan languages. But if this is the case, how are the forms *vīsąs θrisąs* to be understood?

As has been pointed out above, *vīsąs* is a hapax, restored at Yt. 1.19 from the manuscript-variants *vīsąstača* (adopted in Geldner's edition), *vīsąstasča, vīsąsčasča, vīsąstisča*. That this group of letters must contain the numeral "20" is pretty clear from the obvious reference to the twenty names enumerated in sections 7 — 8. It is also important to note that the list there ends with *vīsąstəmō ahmi yaṯ ahmi mazdå nąma* "zwanzigstens bin ich: bin ich Mazdāh mit Namen"[25], and *vīsąstəmō* (variants *vīsąštəmō, vīstąstəmō*) is beyond any doubt the ordinal "20th". It is evident that *vīsąstəmō* and the cardinal "20" concealed in the sequence *vīsąstača* sim. are closely linked, as is shown by *-ą-* in both forms which is not found elsewhere. Hübschmann decided that the cardinal was **vīsąsta* from **vīsąt-ta-*, while Geldner divided the group as *vīsąs tāča* and Bartholomae, accepting this division, interpreted **vīsąs* as an uninflected adjective and *tā* as the NS (nom. sing.) of the pronominal stem *ta-*.[26] The latter assumption is completely incomprehensible. If NS really means

[23] Note that no Middle or Modern Iranian dialect points to more than *θrīs + VC*.

[24] Note the sequence 3 — 6 — 9 — 10 — 15 — 20 — 30 — 50.

[25] Wolff 154. H. Lommel, Die Yašt's (1927) translates: "zwanzigstens bin ich der Weise genannt".

[26] Hübschmann, ZDMG 28, 1874, 80; K. Geldner, KZ 27, 1885, 225[1]; Bartholomae, Arische Forschungen 1, 1882, 154; Grdr. I 111. 113; AiWb. 1458.

"nominative singular" (and is not a misprint), no reference can be found for it since even the way out of taking **vīsąs* as the feminine nom. with which *tā* agrees is barred by the statement that *vīsąs* is used adjectivally with *nāmənīš*; besides, the fem. (or masc. ?) nom. would be *hā*, not *tā* (cf. Skt. *sa/sā/tad*). If, on the other hand, *tā* is interpreted as NP, i. e. the ntr. nom. pl., we must explain the simultaneous use of *tā* and *imå*. To be sure, Bartholomae did assume such a usage[27], but the only example is the one under consideration. The other example claimed by him is quite different. It is in the same Yašt (1. 15): *tåsča imå nāmənīš*. But here the two demonstratives are justified: *tåsča* is the subject to *imå nāmənīš* "haec sunt illa nomina"[28]. At 19, however, *vīsąs tāča imå nāmənīš* cannot be interpreted as "this group-of-twenty is these names", because, and this is grave enough, that would not make sense, but, more important, the whole complex is the subject to the predicate *parštasča pairivārasča vīsənte*[29], and "these those twenty names" is just as impossible in Iranian as it would be in English.

We must therefore conclude that *vīsąsta* is used here instead of the normal *vīsaiti*. How is this possible? The explanation of this curious form becomes clear if we recall that in the same Yašt we also find the unique ordinal *vīsąstəmō*. It has long been recognized that the phrase "these twenty names" in section 19, referring back to 7 — 8, proves that 12 — 15 are later additions[30]; I would go even further and say that the reference at 19 could only make sense if originally it immediately followed on 8. However this may be, it is clear that there is a close connection between *vīsąstama-* and *vīsąsta*. To put it more plainly, *vīsąsta* is extracted from *vīsąstama-*. The mechanism of the process is seen if we look at the formal relation between the two words: it is the same as that between *dasama-* "10th" and *dasa* "10". In other words, the form *vīsąsta* is a replacement of the correct *vīsaiti* under the influence of the preceding *vīsąsta-ma-*, made possible by the fact that the living forms were *vīst* "20" and *vīstum* "20th"[31]. The writer who produced *vīsąsta* obviously ventured it on the strength of the analogies of his own living speech,

[27] AiWb. 370 middle; 613 bottom; 616 bottom.

[28] We might have felt it more natural to say: *imåsča tå nāmənīš* "these are the (= my) names".

[29] Wolff 156: "Und diese (genannten) zwanzig Namen dienen als Rückhalt und Schutzwehr".

[30] Cf. Lommel, Die Yašt's 16[3].

[31] Note that now Chr. Sogd. *wystmyq* "20th", *ywwystmyq* "21st" are also attested (to be added to Gershevitch's list, GMS § 1331 f.).

especially the fact that the ordinal suffix was no more than the syllable *-um*.

Thus the complex *vīsąstača* is no evidence for an abnormal nom. **vīsąs* but only for an archaizing cardinal *vīsąsta* based on the ordinal. Now the formation of the latter is quite clear: *vīsąstama-* represents OIr. **vīsat-tama-*, formed in the same way as Gk. εἰκοστός or Lat. *uīcēsimus*, i. e. from IE **wikmt-to-*[32]. The only deviation is presented by its *ą* which, according to Bartholomae, was based on the cardinal nom. **vīsąs*. This way out has proved unacceptable. But it is also unnecessary. There are several cases where *-ąs/-as* alternate without any clear (linguistic) reason. The best known are the present participles, among which we find the type *ǰvąs* "living", *hąs* "being", but also *stavas* "praising", *vispǎ. hišas* "all-observing". Similarly, derivatives of participles often have a superfluous *-n-* (*-ą-*): *uxšyąstāt-* „growth, increase" from *uxšyant-* (expected form **uxšyastāt-* from *-ąt-tāt-*), *iriθyąstāt-* „dying, death", *nərəfsąstāt-* "decrease", *būšyąstā* "the daēvī of sleepiness". An interesting example is *vərəθraǰąstā* "Sieghaftigkeit", *vərəθraǰąstara-* "siegreicher", *vərəθraǰąstəma-* "siegreichst" where, since the positive is *vərəθragan*, and thus, quite apart from the *-ǰ-*, a nom. in *-ąs* cannot be invoked, Bartholomae thought of "Anlehnung an einen halbwegs synonymen Superlativ eines Partizipiums"[33]. There can be little doubt that the model was *vərəθra.vastara- -vastəma-* "id.", where *-s-* is from *-vat-t-* (the positive is *-van-* and *-vant-*); but we should add that *(ţbaēšō.)taurvayąstəma-* is also in the same semantic field. If Bartholomae is right in saying that there is nothing in the way of equating Av. *dąstvā* with MP. *dast*[34], we have another instance where for the speaker of Middle Iranian the Avestan form had an extra *n* sound. These examples justify the assumption that *vīsąstəma-* is a later spelling form for the only reality, *vīsastama-*.

The position of *θrisąs* is rather different. There the existence of an ordinal is not at all certain. Bartholomae emends the manuscript-reading *θrəstəməmčaţ* at Nīrangistān 51 to +*θrisastəma-* "30th", but even if this were correct, the form would not show an *ą*[35]. But if we look at the context in which the nominatival *θrisąs* occurs[36], we find it embedded in

[32] Skt. *viṁśati-tama-* is secondary from **viṁśat-tama-*.

[33] AiWb. 1423.

[34] AiWb. 745. For the Middle Iranian forms, cf. now also Benveniste, JA 243, 1955, 316.

[35] See fn. 14 above. Strangely enough, Bartholomae posits *ą* in the Index to AiWb., p. 1934, although the nasal is absent in the text, p. 810.

[36] The passage was quoted above, p. 117.

the phrase *θrayasča θrisąsča*. Now it is well known[37] that in sandhi a final *-t̰* appears as *-s*: *yas-ča* for *yat̰-ča*, *raēvas.čiθrayå* beside (etymological) *raēvat̰.č-*. This means that the form *θrisat*, corresponding to Skt. *triṁśat*, and found in the derivative *θrisaθwant-*, would appear as *θrisas.ča*. On the other hand, *vīspəsča* appears instead of *vīspąsča*[38], reflecting an earlier *-ans-ča*: *-a(n)sča* variation. It is therefore preferable to interpret *θrisąsča* as a spelling-form of *θrisasča*, from *θrisat-ča*, rather than accept an unsupported formation **θrisant-s*. The two other instances in the *Vidēvdāt* (14. 9), in which *θrisąs* functions as an "instrumental", are ungrammatical and the interpretation hardly final[39].

We can therefore state that Avestan only knows the forms *vīsati θrisat čaθwarsat pančāsat*, in full agreement with Indian. The forms in *-satəm* are not stereotyped accusatives of nouns in *-ant-* but expanded from *-sat* on the analogy of *satəm*. Scribal tradition rather than linguistic history explains the unique *vīsąsta* and the peculiar *θrisąs*.

The other branches of Iranian agree with this picture. We have seen above (p. 49 f.) that all Iranian dialects point to forms in which *θrīs-čaθwars- pančās-* were followed by a syllable, more precisely by a vowel (and a consonant). But the usual assumption that the lost syllable was *-ąs* is now seen to be without foundation. The forms must be traced to OIr. *-sat*.

It has often been assumed that the Iranian decads are feminine nouns[40]. The evidence itself presents no basis for such a statement in the set "20 — 50". Any such assertion must rest on the tacit assumption that the Indian state of affairs (cf. Ved. *tisráḥ pañcāśátaḥ* "3 x 50") represents the Aryan position. However, even if *θrisąs* could be accepted as a linguistic reality, it would only prove the non-neuter character of the noun[41]. Moreover, even for the set "60 — 90" the assumption is far from being certain. These decads are only found in the forms *xšvaštīm haptāitīm aštāitīm navaitīm*, which do not prove a nom. in *-tiš*; it is sufficient to assume that they started as formations in *-ti* but under the influence of *satəm* acquired a final *-m* (*-tim*[42]), just as the preceding "30 — 50" did.

[37] Cf. Bartholomae, Grdr. I 180 § 304 II a) 2.

[38] Bartholomae, l. c. 8, and p. 182 § 304 II d) 42.

[39] Cf. the translation in Wolff 406.

[40] Bartholomae, Grdr. I 111; AiWb. s. vv.; Reichelt, Awestisches Elementarbuch 215.

[41] This is rightly emphasized by Wackernagel-Debrunner, AiGr. III 369.

[42] No one will assume that *-tīm* points to a stem *-tī-*. For the spelling see Reichelt, Elementarbuch 32. Note that in Vedic, too, we find *navatim* used as an instr. or gen., "gewiss nach *śatam*" (Wackernagel-Debrunner, AiGr. III 364).

The fact that an "acc. plur." *navaitīš* is found at V. 22. 2, 6, 9 and Yt. 13. 59, 60, 61, 62 (in the formulae: *navača navaitīšča* . . . and *navača yaskə̄ navaitišča* . . .) cannot establish an old *-i*-stem inflection. If the ending was originally *-ti*, the (occasional) inflection according to the *-i*-stems was quite natural as is shown by Skt. *viṁśati-ḥ*. The alleged "dual" *(duye) navaiti* (V. 14. 17 ter) is hardly a genuine inflected form; it is either the uninflected *navaiti* or an imitation of the frequent *duye saite* "200".

Turning now to Indian, we may state first of all that there the decads, when used as nouns, are treated as feminines, whether this is inherited or an innovation; cf. *tisráḥ pañcāśátaḥ* "3 x 50" (RV. 1, 113, 4), *tisr̥ṇā́m saptatīnā́m* "3 x 70" (RV. 8. 19. 37)[43]. The decads are employed either as substantives, with the dependent noun in the genitive: *pañcāśátam áśvānām* "50 horses" (RV. 5. 18. 5), or as adjectives: *catvāriṁśátā háribhiḥ* "with 40 chestnut horses" (RV. 2. 18. 5). In either case they are normally inflected. "20" declines as an *i*-stem: nom. *viṁśatí-ḥ*, acc. *-tim*, instr. *-tyá*. "30 — 50" are regular *-t*-stems: *triṁśát -śátam -śátā -śáti*; *catvāriṁśát -śátā*; *pañcāśát -śátam -śátā*. "60 — 90" are normal *-ti*-stems and thus agree with *viṁśati-*: *ṣaṣṭíḥ ṣaṣṭím ṣaṣṭyá*, *saptatím saptatyá*, *aśītyá*, *navatíḥ navatím navatyá* (or *navatí*).

That "20" is inflected as an *-i*-stem, must be considered a purely Indian innovation since even Iranian preserves the old form **wīkm̥tī* in Av. *vīsaiti*. But the inflection is hardly due to *ṣaṣṭi-* etc.[44] since no connection can be discovered between "20" and "60 — 90". It is surely sufficient that "30 — 50" and "60 — 90" were all inflected: if *viṁśati* was to fall in line, it could hardly do it in any other way than by adopting the *-ti*-stem pattern. It is more difficult to understand the inflection of "30 — 50" if, as is commonly assumed[45], they were originally based on an ablauting second member *-kont-s/kont-m̥/-kn̥t-os* etc. For in that case how can the emergence of *-śat/śatam/śatā* instead of *-śan/śantam/śatā* be explained, especially as the strong cases with *-an-* would have been supported by the numerous group of stems in *-nt-* ?[46] We have also seen that Av. *θrisąs* cannot be used in support of such an assumption[47].

[43] Cf. Wackernagel-Debrunner, AiGr. III 360 f., 369.

[44] As suggested by Wackernagel-Debrunner, AiGr. III 367.

[45] E. g., Wackernagel-Debrunner, AiGr. III 368.

[46] The former derivation of the Vedic type *vahát-* from *-ant-* is now abandoned, see Wackernagel-Debrunner, AiGr. II 2, 159; Sommer, Münchener Stud. z. Sprachw. 4, 1954, 1 f.

[47] Wackernagel-Debrunner, AiGr. III 368 say: "eine starke Stammform *-šant-* wird für das Indoiranische durch jAw. *θrisąs* gesichert" (!).

Before we can attempt an explanation of the Aryan formations, we must examine the position in the remaining languages.

As can be expected, Tokharian throws little light on our problem. In Eastern Tokharian (A) only *-k* survives: *taryāk śtwarāk* etc., while Western Tokharian (B) has *-ka*: *täryāka śtwārka* etc. Meillet had found it impossible to decide whether *täryāka* was of the τριᾶκοντα or the *triṁśat* type, in other words whether its first member was the plural **triyə* or the compositional form **tri-*[48]; this would entail a corresponding hesitation between a final *-kontə* and *-k(o)nts*. Pedersen, however, opted for a form **triyākn̥ts* as the antecedent of *täryāka*[49]. But it is difficult to see how such a form can be fitted into the IE system. Windekens seems inclined to regard *-k* as the only remnant of the IE ending, while *-a* would be secondary from the nouns[50]. We must conclude that, as far as the second element is concerned, the evidence of Tokharian amounts to nil.

Slightly more favourable is the position in Armenian. "20" appears as *k'san* and this proves that in an early **gisanti*, from IE **wīkm̥tĭ*, not only the final vowel was lost but also the *-t-*. On the other hand, *ekn* "he came", from **ekent*, IE **e-g^{w}em-t*, shows that the vowel before IE *-nt* was syncopated[51]. It follows that the second member *-sun* appearing in "30 — 90" must have had a vowel after *-kont-* whether that was IE *-ə* or *-ā*[52]. Bolognesi (l. c. fn. 2) also accepts this view but adds: "a meno che in armeno tutti questi numerali per il vocalismo finale non siano stati rifatti analogicamente su *k'san*". This is not quite clear but it may warn us that the vowel was not necessarily an IE *-ə* (or *-ā*). Even a form *-kont* could have kept its *-on* (later *-un*) if before the loss of *-t* it acquired from "20" a final *-i* (or whatever this had become by that time) which later,

[48] MSL 17, 1912, 291.

[49] Tocharisch 225. 253.

[50] Morphologie comparée du Tokharien, 1944, 211.

[51] Cf. Meillet, Esquisse[2] 125; Bolognesi, Ricerche Linguistiche 3, 1954, 127. This explains the similar weakening in *tasn* < **tasant* < **dekm̥t*. As to the curious development of **wīkm̥tī*, through **gisanti*, into *k'san*, Vogt now maintains (NTS 18, 1958, 152) that his new theory of the preservation of the IE mediae aspiratae in Armenian easily accounts for it: initial *ghi-* (not *gi-*) gave rise to **gh(i)san*, and with devoicing *k'san*. The difficulty is that whereas a change of initial *w-* to *gw-* is found in many languages, a similar change to *ghw-* is, as far as I can see, unknown. This would mean that a primary **gisanti* changed to **ghisanti*, which is very unlikely. So it seems still best to assume that the change is due to *g* becoming an aspirate (and then naturally voiceless) when in contact with an immediately following *s*.

[52] Meillet, Esquisse[2] 100.

after the stabilization of the accent on the penult (*-sónti*), disappeared together with *-t*. A further possibility to be borne in mind is that an influence of the same kind may have come from "100", or from both these numerals flanking the set "30 — 90"[53]. All we can say is, then, that Armenian gives strong support to an *-o*-grade form but leaves open the question whether the second part was *-kont (-kont-s ?)* or *-kontə (-kontā)*.

Much the same applies to Germanic where the second member appears in the form *-hund*. *Prima facie*, this would seem to indicate an IE ending *-kn̥t-* with a short vowel after the group, that is IE *-kn̥tə*, certainly not *-kn̥tā*. But here again it is obvious that *-un-* (or even an earlier *-n̥-*) is due to secondary transformation from *-an-* (IE *-on-*): placed between **wīkm̥tī* and **km̥tom* or, at the Primitive Germanic stage, between **wīχunÞī* and **χunÞan*, the ending of the set "30 — 90", *-χanÞ-*, was brought into line by being changed to *-χunÞ-*. We may even state that the inference that *-hund* was originally followed by a short vowel is not necessarily correct. For, as in Armenian, the existence in "20" and "100" of a vowel after the characteristic part *-kn̥t- (-χunÞ-)* would have been sufficient to prevent the regular phonetic development to *-χun*. We can, however, regard it as certain that Germanic cannot reflect a nominatival *-kont-s*, for in that case we would have *-hands* or *-hunds*, not *-hund*; cf. Goth. *bairands* from IE **bheronts*. On the other hand, it is *a priori* not impossible that an accusatival *-kont-m̥*, transformed to *-kn̥t-m̥*, could be reflected by Gmc. *-hund*, although in that case we would have to assume that the expected ending *-u (-hund-u)* was again lost. Thus the Germanic data are compatible with an IE formation in *-kontə/-kn̥tə* or *-kont/-kn̥t-*.

Clear evidence for a final *-ə* or *-ā* seems to be provided by the Classical languages. Greek has the ending *-α* in *-κοντα*, while Latin offers *-ā* in *-gintā*. The discrepancy in the quantity is usually explained by saying that Greek presents the expected ntr. plur. ending of consonantal stems, that is IE *-ə*, while Latin replaced this by the ending of the *-o*-stem neuters, namely *-ā*. The objection that there is no trace of a long-vowel ending in the Latin ntr. plurals is met with the statement that *-ă* in the ntr. plur. is due to secondary shortening from *-ā* — as is shown by *-gintā*.

This argument is clearly circular: the original ntr. plur. ending *-ă* (from *-ə*) was replaced by *-ā* as can be seen from *(trī)gintā*, which, in turn, is a ntr. plur. because it has *-ā*. Nevertheless, the assumed development might be a true picture of what happened between Indo-European

[53] Cf. Gmc. **neun *sebun* with *-n* retained after **tehun*, the only numeral where it was legitimate.

and historical Latin. But the matter is not as simple as it looks from this analysis.

The difficulties inherent in the assumption that an original *-ā* was preserved in Latin have been shown up by Lejeune[54]. In his view, *-ā* was regularly shortened to *-ă*, except where the system preserved it: *amā* because of other forms in which *-ā-* in non-final positon was kept *(amās amāte* etc.). As to the decads, he suggests that in *quadrāgintā* the final *-ā* was kept by the middle *-ā-*, the two forming a sort of rime (as in *uīgintī*); from here it spread to the whole series.

But if an original *-gintā* would have been shortened normally and was only kept or restored for some extraneous reason, the question arises whether *-ā* could not have been introduced for the same (or other) reasons, even though it had not existed before. After all, the only reason for assuming a ntr. pl. *-ā* in Latin is the existence of *-gintā*. The fact that the Oscan-Umbrian group does have *-ā* in the ntr. pl., does not necessarily prove that Latin also had it. Moreover, Gk. *-κοντα* makes it advisable to start from *-ă* (IE *-ə* ?) rather than *-ā*.

Looked at in this light, the problem of Lat. *-gintā* assumes a different complexion. For, if the original ending was *-ă*, that would have been lost, and the ending would have become *-gint* (or *-gunt* from *-konta* ?). It is obvious that such an ending would have been inconvenient and that for that reason the speakers, in an attempt to save it, would have lengthened the short vowel. And since in "40 — 70" and "90" the ending was preceded by *-ā-*, it is not unnatural that this circumstance should have favoured the lengthening in the form of *-ā*. In *trīgint-* the analogy of *uīgintī* could have led to **trīgintī* but it is obvious that "30" always went with the following decads and thus *trīgintā* was established; "80" naturally followed the same line.

These considerations clearly show that there is no reason for regarding the forms of Latin and Greek as representing different prototypes: both can continue an earlier *-kontă*.

Summarizing the results reached so far, we can state the following. The morpheme of the decads appears as an inflected masc. noun *-kont-s* in Celtic. In Aryan we have found no evidence of the same formation; instead, the existence of an ending *-śat* became clear which, under the influence of "100", acquired in "30 — 50" the form *-śatam*, and, in Indian at any rate, developed on this basis a full *-t*-stem paradigm. Germanic

[54] BSL 45, 1949, 104 f., esp. 110.

and Armenian are compatible with either *-kontə* or *-kont*, while Greek and Latin seem to continue *-kontə*[55].

How is this curious picture to be interpreted? In particular, is this evidence of such a nature as to warrant the assumption of a twofold system of decad-formations, the coexistence in Indo-European of compound feminine collectives in *-kmt-s* (e. g. **trĭ-kmt-s*) alongside of inflected juxtapositions of the type **trī kontə*, stereotyped in the neuter plural form?

As concerns the first type, now that the alleged Av. *vīsąs* has been shown to be non-existent and *θrisąs* would be the only representative of the "type" in Aryan, one will hardly be bold enough to continue postulating an IE prototype on the strength of Celtic alone. But the assumption of neuter juxtapositions is no better founded, although the case in favour of this has been vigorously restated in recent times.

In a paper on "The IE decimal system of numerals", the Lithuanian scholar Mažiulis advanced the following theory[56]. In IE the numeral "10" was the indeclinable **dékm̥*. The forms found in Baltic, namely Lith. *dešimtis*, OPruss. *dessimpts*, Latv. *desmit* (from *desimt*), also derive from **dékm̥* but introduced a "determinative" *-t-*, also found in Goth. *taihun*; this, however, is not Old-IE but "appears to be an innovation of the latest periods", the compositional form of "20 — 90" having been generalized" (pp. 54 — 5). For in "20 — 100", consisting of juxtapositions of "2 — 10" with "10", the latter had been enlarged with *-t-*, as were other old sonant-stems, such as **yekʷr̥t*. In some IE languages, "20 — 90" became compounds very early (hence the nil-grade in **(de)kmt-*), in others much later (hence **dekmt*). "20" was **(d)wī dekmtĭ* from earlier **dwiə dekmti(ə)*. "30" is shown to be a ntr. pl. phrase by Gk. τριᾶκοντα from **triyeə₂-kontə*; in Greek, apart from τριᾱ- (!), the ntr. pl. ending is *-ᾰ*, but Lat. *-gintā* has *-ā* from *-eə₂* (though *trī-* is from **triə*, not **triyeə₂*). As to the second member *-kont-*, its *-o-* probably is not Old-IE — because at that time the decads were only juxtapositions — but emerged in a later period when **dekmt* had become *-kmt*. The old form is reflected by Lat. *trīgintā* from **triə dekmteə₂*. In contrast to this, the Aryan forms of "30" (and "40 — 50") are innovated, representing derivative singulars. But in Greek and Latin, "40" is again proved to be a ntr. pl. by τετρω- = *quadrā-* from **kʷetwr̥ə*. In "50 — 90", Greek extended the ending *-η*

[55] Lat. *-in-* is hardly suited to prove an IE form *-kn̥t-*; it is probably from a secondary *n̥*, introduced from "20" and "100".

[56] V. P. Mažiulis, "Indojevropejskaja decimal'naja sistema čislitel'nyx", Voprosy Jazykoznanija, 1956/4, 53-9.

of πεντή(κοντα) which itself is based on the analogy of **k^{w}etw̄-*. In the same way, Latin extended *-ā-* from "40"[57]. The important point is that the Greek and Latin forms of "30 — 40" show that, in IE, "20 — 90" were formed by juxtaposition, the members of the phrase having the ntr. pl. form: *dwiə dekm̥ti(ə), tri(e)ə$_2$ dekm̥t(e)ə$_2$, k^{w}etwr̥ə dekm̥t(e)ə$_2$, penk^{w}e dekm̥t(e)ə$_2$* etc., down to *newm̥ dekm̥t(e)ə$_2$* (pp. 56, 59).

That the decads were phrases, not proper compounds, is also proved by Baltic, Slavic and Germanic, where these numerals became compounds very late; indeed, in Lithuanian, we find *dvì dẽšimtys (-ti)* even today.

What strikes the reader most in this theory is the confidence with which the data of the Northern IE languages are treated as being of equal status to the far earlier attested Southern and Eastern languages. No allowance is made for the possibility that Balto-Slavic may have abandoned an inherited system more faithfully represented by the Southern and Eastern groups; the very fact that, in "70 — 90" at any rate, Germanic is in agreement with them, is ignored. Furthermore, in the alleged neuter plural formations **trieə$_2$* and **triə*, **dekm̥tə* and **dekm̥teə$_2$* are assumed without even an attempt to explain how this variation was possible. What is worse, while the ntr. pl. sign appears as *-ə* in Gk. -κοντα, in "3" it is assumed to have been *-eə$_2$ (*tri-eə$_2$)* in the same language. That the alleged contrast between simple **dekm̥* and **dekm̥t* with a determinative *-t-* is without foundation, has been shown above (Ch. IV).

But even on Mažiulis's own theory it remains unintelligible how the forms in *-kont-* could ever emerge. If the primitive form of "10" was **dekm̥* and the enlarged form **dekm̥t* also had *m̥*, it is impossible to see how in the latter *m̥* could be replaced by *-om-*. To say that "in a number of languages *km̥t* later received other grades, probably connected with the accent" (p. 56), does not explain the matter, since, in the absence of original forms in *-komt-*, or *-kemt-*, this could only have been created on the analogy of some regular variation, and such variation is totally foreign to the IE ntr. stems. To take the (only) example mentioned as a parallel of the alleged *-t*-enlargement, IE **yek^{w}r̥t/yek^{w}nes* does have the enlargement *-t-* in the Greek inflexion but we do not find a plural **ἥποντα* but only ἥπατα. It must also be emphasized that the identification of the *-t-* of **dekm̥t* with that of **yek^{w}r̥t* is quite superficial: while in **dekm̥t* it is never absent, indeed is explicitly stated to be present in the ntr. pl. **dekm̥t(e)ə$_2$*, in **yek^{w}r̥t* it is confined to the nom. acc. sg. To be sure, in Greek it

[57] Mažiulis is unaware of Sommer's work. He still operates (p. 56) with a Lat. **octuāgintā* as the source of *septuā-*.

is extended to the whole inflexion[58] but there is no trace of it in Latin or Indian; yet, Gk. -κοντα is paralleled by *-gintā* and *-śat*.

But it is not only such details that are open to objection. The whole basic concept of the decads representing ntr. pl. juxtapositions is questionable. Of course, Mažiulis is not the first to adopt this view. Over 70 years ago, Thurneysen maintained that *-kont-/kn̥t-* was a neuter noun[59] and this view has been held ever since[60]. But the basis of this assumption is very slender: it is simply the ending of *-gintā* -κοντα "supported" by the first members τριᾱ- τετταρα-. But we have seen that τριᾱ- is a late, and solely Greek, transformation of **trī-*, which would never have suggested an interpretation as a ntr. pl.; τέτταρα- is admittedly very late, and its forerunner **kʷetwr̥* is no more cogent as a proof of neuter inflexion than **trī-*. Thurneysen's assumption that **penkʷēkont-* also contains a ntr. pl. **penkʷe-a* (l. c.) is now generally abandoned[61]. The usual view that **wī-kn̥tī* is a neuter dual might be acceptable as far as *-kn̥t-ī* is concerned; but *wī* as a ntr. dual, whether it be from **dwo-* or a parallel **wo-*, is at variance with the well-attested ntr. form **dwoi* (Skt. *dve*, OCS *dъvě*, OPruss. *dwai*).

Equally difficult is the assumption that **dekn̥t* is a neuter but, as is shown by the "collective type in *-kont-s*", also a feminine, a view repeatedly voiced by Meillet[62]. Sommer, on the other hand, firmly holding to a fem. collective **dekn̥t*, rejects the notion of a ntr. *dekn̥t* and holds that the cardinal "10", with which the collective **dekn̥t* was fused at an early date, being an indeclinable adjective, had no gender; "daß die auf solcher Grundlage erst geschaffenen Mehrheitsdekaden, soweit hier Numerusendungen erscheinen, diese in neutraler Form zeigen, scheint mir bei einem Indeclinabile nicht auffallend und beweist nichts für ein Genus von 10"[63]. In view of our earlier results we must of course reverse the process: the original form **dekn̥t* (of which **dekn̥* is only a sandhi-variant) could be used as an adjective but also as a noun. Even so, the

[58] If, indeed, the -τ- there is identical with the *-t* in **yekʷr̥t*.

[59] KZ 26, 1883, 310.

[60] Cf. Schmidt, Die Pluralbildungen der idg. Neutra, 1889, 295 f.; Brugmann, MU V 17 f., 22 f., etc.; Streitberg, IF 5, 1895, 373 f.; Wackernagel-Debrunner, AiGr. III 368; Meillet-Vendryès, Traité de grammaire comparée des langues classiques, 1953², 515 f.; Kent, The forms of Latin, 1946, 79; Pokorny, IEW 192. 643; Burrow, Sanskrit 260.

[61] With one surprising exception: Wackernagel-Debrunner, AiGr. III 368 (and Burrow, l. c. ?).

[62] Cf. especially RES 5, 1925, 179. 181 f.

[63] Zw. 21 fn. 1.

assumption that an indeclinable adjective could become a ntr. plur. is far from easy to understand, especially as **dekm̥t* itself, when it became inflected, did so as a feminine (*daśat-*, δεκάς) or masculine (*tigus*, *deśet-*), not as a neuter.

As far as I can see there is only one way out of the impasse. We have established that the decads *wīkm̥tī trīkont kʷetwr̥̄kont penkʷēkont sweks-kont septm̥̄kont oktōkont newn̥̄kont* showed no variation in their first member: there is not the slightest indication of a difference between inflected and stem compounds. From this it follows that there can have been no difference in the second part either: it is useless to force forms in *-konts* or *-km̥t* into the strait jacket of abstract collectives but those with a vocalic ending (-κοντα, *-gintā*) into the category of neuter plurals. In view of the fact that the IE numerical system is a well-established set, in which the forms of "2 — 10" and "100" show no variation whatsoever, it is unreasonable to assume that "20 — 90" were left in a fluid state, without a conventionally accepted norm. On the contrary, it is imperative to try to understand the various formations of the individual languages as deriving from one common pattern which, however, lent itself to the various transformations realized in the individual languages.

Now our findings have shown that the second member varies between *-kont* in Celtic (inflected), Germanic, Armenian; *-km̥t* in Aryan, and *-k(o)ntə* in Greek and Latin. It is also evident that *-kont* is a shortened form of **dekomt*, which preserves the full vowel of the second syllable but lost that of the first, in contrast to **dekm̥t* where the ablaut worked the other way round. But if this is true, is it necessary to look for a (ntr. plur.) case-ending in *-kont-*? After all, **dekm̥t* was generally used in Late-IE as an uninflected form and even when it acquired an inflection, it became a singular animate noun, not a neuter. In other words, if **dekm̥t* was uninflected, it is unjustified to expect anything but an uninflected form in the decads "20 — 90". This means that "30" was **trīkont* from **tri-d(e)komt*, "40" was **kʷetwr̥̄kont* from **kʷetwr̥-d(e)komt* etc.; of the position of **wīkm̥tī* we shall speak further on.

We must now examine whether and how this assumption can account for the second members found in the individual languages.

In Celtic the numerals in *-ont* became singular nouns — just as "100" was one, and probably under its influence — but owing to the ending they fell in line with other formations in *-nt-*, and *-ont-* determined their being interpreted as masculine. The forms found in Armenian and Germanic call for no comment after what has been said about them above (p. 126 f.). In Aryan, an inherited ending *-ant* would already have been

reduced to *-an(t)* in the Aryan period, thereby losing the most conspicuous link *(-t)* with **wīšati* and **šatam*. There were two possible remedies: either *-šant* could be transformed to *-šat*, and thus brought into full harmony with *-šati* and *šatam*, or an effort could be made to maintain the final *-t*; the latter was only possible by supporting the final *-t* with a murmured *-ə* wich in due course resulted in *-i*[64]. It seems that both procedures were employed but with an interesting distribution: *-ša(n)t* in "30 — 50", but *-šanti* in "60 — 90"[65]. The reason for this distribution seems fairly clear: under the influence of "100", "50" was stabilized as *-šat* and, placed between **wīšatī* and **pančāšat*, "30 — 40" also adopted this ending. In "60 — 90", however, *-šanti-* prevailed at first, but later **š(w)aššanti *aštāšanti*, too, were reduced to **š(w)aššati *aštāšati* and served as the starting point for further transformations[66].

The speakers of Pre-Latin and Pre-Greek were faced with much the same situation. The inherited formations in *-kont* were bound to lose the final dental, and a reduction to -κον and *-kon* was resisted for obvious reasons, and in the same way. In Greek, the supporting vowel *-ə* naturally developed into *-α*: hence -κοντα. This phenomenon is fairly well-known in Greek in the names of the letters of the alphabet where the Semitic names with a stop ending (*'alp*, *bēt* etc.) had to be made pronounceable by means of a supporting vowel -α (ἄλφα, βῆτα etc.). Just as clear is the case of the interjections σίττα ψίττα ψύττα, which, as Schwyzer rightly says, simply represent "*st*!" "*pst*!" adapted to the normal Greek word-structure[67].

Less clear is the position in Latin. That there, too, *-kont* would have been reduced to *-kon*[68], thereby resulting in a completely isolated word-ending, and at the same time, losing contact with "20" and "100", is of

[64] As will be shown elsewhere, this, and not a mysterious laryngeal element, is the explanation of the curious *-i* found in some Skt. neuters: *hārd-i*, *akṣ-i*, *asth-i*, *sakth-i*. These should normally appear without any ending in the nom-acc. sg. But **hārd *akṣ *asth *sakth* would have been reduced to **hā(r) *ak *as *sak* (cf. Ved. *nag j-* from *nakt-s*, Wackernagel-Debrunner, AiGr. III 233) and in order to prevent the disintegration of the paradigm and in particular the very real threat of the nom-acc. becoming unrecognizable, a supporting vowel was added, that is *-ə*. These formations have nothing to do with a heteroclitic suffix *-i-*; there is obviously no "fundamental" difference between Av. *ast-* and Ved. *asthi*, except that in Avestan the stem *ast-* is kept (*asča*, *astəm*, *azdibiš* = *[azd-biš]* etc.).

[65] See Ch. III, p. 49 f.

[66] Cf. Ch. III, p. 57 f.

[67] See Schwyzer, KZ 58, 1930, 170 f.; GG I 140. 409.

[68] On the question of *-n*, not *-ns*, being the development from *-nt*, see Szemerényi, Glotta 35, 1956, 105 f. with references.

course well known. But the way out is less obvious. It is, however, known that *-i* or *-o* would have been lost again. It is not surprising, therefore, that *-a* (from *-ə* ?) should have been used which, when threatened with loss in its turn, was lengthened, the lengthening being favoured by the existing long *ā* before *-kontā* in "40 — 90"[69].

In view of these considerations it seems plain that the IE decads were uninflected compounds with **d(e)komt*, without a case-ending. How can this analysis be reconciled with the form of "20" ? IE **wīkm̥tǐ* is usually regarded as a clear neuter dual. But we have already noted the difficulty of explaining *wī-* on this assumption. Now we must add that the form expected on the basis of "30 — 90" should end in *-kont*. Once this is admitted, it is clear that **wīkont*, the decad immediately following after "10" and of necessity often used with it and the set "11 — 19" formed with **dekm̥t*, was influenced by the latter and resulted in **wīkm̥t*. A further development was that **wīkm̥t* was reinterpreted as "two tens" and then provided with a clear dual ending *-ǐ*. But the bulk of the decads ("30 — 90") remained unaffected by this change and retained the uninflected ending *-kont*[70].

When dealing with the decads we should also bear in mind that they have not only what may be called "vertical" interconnections with each

[69] An interesting parallel is provided by Hebrew where the old short vowels would have been lost in final (unaccented) position. To prevent this, they were lengthened. E. g., *hū'ā*, 'he', *hī'ā* 'she' in the Dead Sea Scrolls, from earlier *hū'a*, *hī'a*. Cf. H. Birkeland, Akzent und Vokalismus im Althebräischen, 1940, 12 ff.; 62 ff.; Interpretationes ad Vetus Testamentum pertinentes Sigmundo Mowinckel septuagenario missae, Oslo 1955, 24 f., esp. 28 f.; Essays R. Jakobson, 1956, 46 f.

[70] A rather similar approach appears in I. M. Tronskij's paper "K semantike množestvennogo čisla v grečeskom i latinskom jazykax" (Učenyje Zapiski Leningradskogo Universiteta, Serija filologičeskix nauk, vypusk 10, 1946, 54 – 72). Discussing the semantics of the plural in Greek and Latin, he argues that in Proto-IE only the singular had a fully developed case-system while the dual and plural only had the subject-object cases. He thinks that a trace of this early state of affairs survives in the indeclinability of the Greek and Latin decads. "These numerals — he says (67[1]) — are formed like the nom-acc. of the dual and plural of the neuter . . . It is commonly assumed that the inflexion was given up and this is explained as due to the lack of inflexion in the preceding numerals 5 — 10. It is much simpler to suppose that the inflexion never existed. The numerals in question were formed at a time when the dual as well as the plural had only one form, the nom-acc., and they did not take part in the further development of inflexion since they became separated from the word "ten" and were no longer felt to be dual and plural forms". (I am indebted to Dr. V. V. Ivanov for procuring a copy of this paper).

other but also "horizontal" relations with the corresponding ordinals. Whether *all* the ordinals had been formed by Late-IE times is questionable. But there can be little doubt that the ordinals for the lower decads at any rate (up to "50" ?) were already in existence. This is proved by the fact that the principle of using the nil-grade of *-kont* before the ordinal suffix is consistently applied in Latin, Greek and Aryan, even when as a result of this the ordinal differs from the cardinal; cf. Lat. *uīgintī trīgintā* : *uīcēsimus trīcēsimus*, Gk. Ϝῖκατι : Ϝῖκαστός, but also τριᾶκοντα : τριᾱκαστός and Skt. *viṁśat-i-tama- triṁśat-i-tama-*. It is clear that the presence of two ablaut grades in the same decad may have helped the tendency to level the various formations and there seems little doubt that the vocalism of Lat. *-gint-*, earlier *-gent-*, is due to this factor; even in Aryan, the ending *-šat* may have been stabilized because of the coexistence of ordinals with that form, just as conversely in part of the Greek dialects the ordinals in -καστός changed to -κοστός under the influence of the cardinals in -κοντα, or more precisely, and more significantly, -καστός was after -κοντα transformed to -κονστός, as is shown by Lesbian εἰκοιστός.

If the view that the decads are neither neuter plural phrases nor collectives in *-kont-s* but simple, uninflected compounds with **dekomt*, is correct, the question arises how the long vowel in *wī- trī- kʷetwr̥̄- penkwē-* is to be acccounted for ? Formerly it used to be assumed that **trī* at any rate was a ntr. pl. form, while **kʷetwr̥̄* was either the same form or was lengthened after *trī* from an original **kʷetwr̥*; **penkʷē* was explained by Brugmann as lengthened after **trī* and **kʷetwr̥̄*[71]. But we have found that a long vowel was originally at home even in "70 — 90", where only "80" could have been supported by the digit. It is, of course, not impossible that the juncture-length should have been propagated from one or two members. But even this basis is removed now that **trīkont* can no longer be regarded as a neuter plural form. Where then has the long vowel come from ?

Since the element *-kont* is a reduced form of **dekomt*, we may ask whether the initial consonant could have disappeared without any trace. The importance of this question will be seen if we add that the vocalic changes contrasting **dek(o)mt* and **d(e)komt* clearly show that an accent-shift must have taken place from **dékomt* to **dekómt*, and this could only occur if **dékomt*, combining with **tri- *kʷetwr̥- *penkʷe* etc., resulted in a new unit with a main accent on a different syllable from that in the simplex **dékomt*. For this proves that **d(e)komt* must have arisen in the compounds and thus we cannot assume that **dekómt* as an independent

[71] MU V 28 – 32; Grdr.² II 2, 33.

word was reduced to **d(e)kómt* and this further simplified to **komt*; in any case, there would be no visible cause for an independent **dékomt* changing its accent to **dekómt*. If this is true, and we must start from the compound units **tri-dekomt *kʷetwr̥-dekomt* etc., then, after the loss of *e*, the forms must have been **tridkomt *kʷetwr̥dkomt *penkʷedkomt* etc. to begin with. The fact that, instead of these forms, we have **trīkont *kʷetwī̆-kont *penkʷēkont*, suggests that the length of the juncture-vowel is a secondary development from the sequence "short vowel + long consonant". In other words, the initial consonant of **dkomt* was not "lost". On the contrary, it was assimilated to the following velar and, at a later stage, the sequence "*short vowel + kk*" was changed to "*long vowel + k*".

This is not the place for showing how this phenomenon fits into a general theory of the origin of the IE lengthened grade. But it is worth recalling that the unmistakable clues have been correctly understood several times in the last 70 years or so, but suppressed every time so that there is practically no trace of the obvious solution in the current handbooks and the present writer had to discover it for himself. Kluge was probably the first to venture this reading of the facts in 1889: he interpreted **penkʷēkont* as due to compensatory lengthening from **penkʷĕ̄-tkont*[72]. Brugmann objected at once[73] that, if this were true, the same would apply to **kʷetwī̆*, which would not be due to the influence of **trī-komtə*; with an engaging naïveté he failed to notice that, if true, it applies to *trī-* as well. Even worse are his "arguments" purporting to show that consonant clusters are retained (e. g. Lat. *siccus*, Av. *taṯkuš-*), overlooking the totally different chronological levels, as is the case also with his reference to ă in ἑπτακόσιοι, a purely Greek formation. The obvious was again discovered by Kretschmer in 1898[74] but only to incur Brugmann's renewed censure[75]. Nevertheless, Schulze reached the same conclusion in the late twenties[76]. I can only hope that in the new form the theory will meet with greater favour[77].

[72] In the first edition of Paul's Grundriss I (1889) 375. 405.

[73] MU V 143.

[74] BPhW 1898, 210 f. (recorded by Schwyzer, GG I 592[3]).

[75] Griechische Grammatik, 1900[3], 215 fn. 1.

[76] I owe this information to Prof. O. Skutsch who attented Schulze's lectures in 1928/29.

[77] Hirt's suggestions (IG 3, 311) that *penkʷē* is either due to "die Wackernagelsche Auslautsdehnung" (but not found in *penkʷĕ̄* where *ĕ* is really in Auslaut!) or "Dehnung des einsilbigen *kʷe*" are worthless. Rosenfeld (Zahlen 181) now suggests "emphatic lengthening" of **penkwékomt-*, but there are no examples for this in IE. See also Ch. III fn. 78.

As was mentioned in an earlier chapter[78], Old Norse has *-tán* in "13 — 16" but *-tián* in "17 — 19". The difference was traced by Kock to a difference in the accent-pattern, depending on whether the digit was monosyllabic or disyllabic: *þrîtehàn fímftehàn séxtehàn* but *sébuntèhan* etc. Something similar may have been responsible for the development in Indo-European. We can be fairly certain that in **k^{w}etwerdekemt *penk^{w}edekemt* etc., because of the length of the forms, there was a primary and a secondary accent. An accent-pattern of the type **k^{w}ètwerdekémt* would account for **k^{w}etw̥̄kont*; conversely, in "30" the accentuation **treidekémt* would have resulted in **trīkont*.

There is one further point, studiously avoided until now, which we must finally face. Since "10" is shown by Lat. *decem/decimus* to have an original *m*, it is usually assumed that the "derivative" was **dekm̥t*, the ordinal **dekm̥tos*, and hence the second element of the decads was also *-komt*. Thus the question arises whether such forms, with the labial nasal before the dental stop, are plausible for IE, the point being that the only language-group attesting this sequence is Baltic, cf. Lithuanian *dẽšimt dešimtas* and *šimtas*. The problem was discussed by R. G. Kent in 1929[79]. He reached the conclusion that "the dental nasal is to be regarded as the regular phonetic development, and that the Baltic *m* is but a product of analogies." In his view the original forms were IE **dekm̥/dekm̥mos*, but **dekn̥t(i)-* and **kn̥tom*. In Lithuanian these resulted in **dešin/dešimas* and **dešintis *šintas*, but under the influence of **dešimas* the other forms also introduced *-m-*, hence *dešimtis šimtas*, and eventually even **dešimas* was replaced by *dešimtas*.

This view is obviously at variance with our own results (Ch. IV) that only **dekm̥t* and **dekm̥tos* can be recognized as the original IE forms. Of course, as far as Baltic is concerned, we need not see in Lithu. *dešimt* etc., at least not in its *-m-*, an uninterrupted continuation of IE **dekm̥t(os)*. In Baltic the ordinals *septmas ašmas* persisted until fairly recent times — they are attested in extant literature — and the same must apply to **new(i)mas (d-?)*. It would not be surprising therefore if, under the influence of "7th — 9th", even "10th" should have been refashioned to **deš(i)mas* which then reintroduced *-m-* in *dešimt(is)* and *šimtas*. That this **deš(i)mas* was later again replaced by *dešimtas* is no more strange than that the original *septmas ašmas *new(i)mas* were superseded by *septiñtas aštuñtas deviñtas*. Furthermore, the one-time existence of **dešmas*

[78] Ch. IV, fn. 155.

[79] Donum Natalicium Schrijnen 344 f.

seems to be supported by the curious Latvian forms *desmit* "10", *desmitais* "10th"; the usual description of the change from *desimt* to *desmit* as metathesis is a statement of an obvious fact but not of its cause.

However, the problem remains for Indo-European. Are **dekm̥t *dekm̥tos* (and **km̥tom*) phonetically unlikely or not? As far as I can see, there are no further examples of this sequence. The corresponding form **g^{w}m̥tos* does not provide a clue: Lithu. *gimti* "to be born" does reflect **g^{w}m̥t-* but its *m* could be maintained, or restored any time, because of the root-form *gim-*. Comparable instances, but with *s* instead of a dental stop, are, e. g., IE **mēmso-* "flesh" and **omso-* "shoulder", if correctly posited in this form. But the evidence for the former is the single Goth. *mimz* — in Latin even an IE **mēnsro-* would give *membrum* because of *-br-* from *-sr-* — and this has recently been claimed as an onomatopoeic word[80]; the structure of **mēmso-* is anomalous in any case[81]. Nor is **omso-* any clearer[82], except that in this case a form **omeso-* is also attested (cf. Lat. *umerus* but Gk. ὦμος) and perhaps **omso-* was retained by **omeso-*. Somewhat clearer is the acc. pl. ending *-ns* which, in spite of various misgivings voiced from time to time, can hardly be anything else but the combination of the acc. sg. ending *-m* with the pluralizing *-s* and thus attests a change from final *-ms* to *-ns*. Brandenstein, who has recently examined the development of IE *ms* and *ns*, reached the conclusion that the heterosyllabic sequence *-ms-* was preserved but tautosyllabic *-ms* gave *-ns*[83]. If this is true, we may perhaps extend his rule to cover the sequence *-mt-* and assume that a heterosyllabic cluster remained but a tautosyllabic *-mt* was assimilated to *-nt*. In the present case this would mean that *-m̥t-* was preserved but *-mt* resulted in *-nt* and thus IE had **dekm̥t *dekm̥tos* and *-kont*. The incipient inflection **dekm̥t/dekm̥-tm̥* would perhaps lead to the generalization of **dekm̥t*, including **wīkm̥tī*, but would not affect the second member *-kont* which would be supported by ordinals in *-km̥t-(t)o-s*.

As to the formative principle operating in **wīkont *trīkont* etc., it is clear that we have before us what in Indian terminology are called dvigu: **trīkont* is a unit (or quantity) consisting of *tri dekomt*. Neither suffix nor case-ending can therefore be expected. Similar formations are later found with higher numerals, e. g. Skt. *tri-śatam* "300". But already in IE times inflexional procedures seem to have been in operation when "100" was formed.

[80] P. Naert, Studia Linguistica 9, 1956, 77.
[81] Benveniste, BSL 52, 1957, 60.
[82] Benveniste, l. c.; Ambrosini, Annali della Scuola Superiore di Pisa 26, 1957, 10 f.
[83] Studien zur idg. Grundsprache, 1952, 5 – 12.

The consensus of the individual languages permits us to reconstruct for "100" the IE word **kṃtóm*[84]. There can be no doubt that this numeral, too, derives from **dekomt* "10". The only question is: how is it formed? Scholars are fairly unanimous in assuming that the meaning of **kṃtom* was "the decad par excellence, the great decad" or "a decad (of decads)". There is disagreement over the morphological interpretation. Some analyze the word as **(d)kṃ-tó-m*[85], others as **(d)kṃt-ó-m*[86]. There is, of course, no reason why "100" should necessarily be formed from "10". In many languages it is not. But if, as is generally agreed[87], IE **kṃtóm* derives from "10", then for us only the analysis **dkṃt-ó-m* is admissible. More important is the fact that the interpretation as a collective is rather difficult. The derivation from "10" can hardly be assumed for a time when the intervening decads "20 — 90" were as yet not formed. But if they existed in the form of clear expressions of the type "two tens . . . nine tens", it is incredible that "100" should be conceived in any other way than "ten tens".

This line of thought seems to have been envisaged both by Brugmann who at one time thought that an expression corresponding to Goth. *taihuntē-hund* might have been the basis of **kṃtóm*[88], and by Hirt who regarded it as a "Kurzform" of a formation of the Gothic type but assumed that *kṃt*, the oldest form of "10" in the decads, as shown by Skt. *triṁśat*, was enlarged with a particle *-om* and the form later interpreted as a neuter singular noun[89]. Quite recently Mažiulis has adopted the same basic approach but, in line with his view of the decads "20 — 90", interpreted **kṃtóm* as based on a juxtaposition **dekṃ dekṃt(e)ə₂*: because of the alliteration (?) this phrase was replaced by the one-word collective **dekṃteə₂*, i. e. **kṃtā*, from which, after its use in "200" etc., the singular **kṃtóm* was obtained by back-formation[90].

[84] I cannot believe in **d(e)ku-tom*, constructed by Pisani (Essays R. Jakobson, 1956, 396) for the sake of Slavic *sъto*; see above, p. 64 fn. 109.

[85] Cf. Streitberg, IF 5, 1895, 372 f.; Lejeune, BSL 29, 1929, 111; Wackernagel-Debrunner, AiGr. III 370; Kent, Forms of Latin, 1946, 80; Jensen, ZfPhonetik 6, 1952, 54 f. (perhaps *-tó-* "amplificative": 100 = "grosse Zehn").

[86] Cf. Brugmann, Sächsische Abhandlungen 25/5, 1907, 37 (earlier, MU V 3, he had said that is was impossible to decide between *-ó-m* and *-tó-m*).

[87] With the sole exception of Brandenstein, see Die erste idg. Wanderung, 1936, 23 fn.

[88] MU V 16. 268.

[89] IG 3, 313; p. 314 he assumes that a particle *-ī* may be present in Skt. *dviśatī* and Lat. *ducentī*, which is impossible.

[90] Mažiulis, l. c. 59.

I am naturally in favour of this principle. But I believe that the ntr. pl. formation never existed and therefore a derivation from **dekm̥ dekm̥teə₂* is ruled out; it should also be noted that while for the decads Mažiulis operates with the variants **dekm̥teə₂* and **dekm̥tə*, for "100" he needs **dekm̥teə₂* as the general IE form. On the basis of what we have found in "20 — 90", we can only expect for "100" the form **dekm̄kont*. Since "100" was no doubt in much greater demand than any other member of the set "20 — 100" it is not unnatural that frequency of usage should have led to the loss of the first syllable. But this would still only lead to **(d)km̄kont*, not **(d)km̥tóm*. I suggest therefore that by the time "100" was formed, the development of the IE inflexional system had already reached the stage where the gen. pl. existed. In other words, "100" was not only conceived, but also expressed, as "ten tens" or "a decad of decads". The primitive form was thus **dekm̥t dekm̥tóm* or **(d)km̄km̥tóm*[91]. Because of the frequent usage the antepenult was shortened and the resulting **km̥km̥tóm*, by haplology, reduced to **km̥tóm*. This form was later, quite naturally, interpreted as a neuter singular noun.

[91] On the gen. pl. sign *-om*, see Vaillant, RES 15, 1935, 5 – 11; BSL 36, 1935, XIX f.; Benveniste, BSL 36, 1935, XXIII f.; Specht, KZ 69, 1948, 127; Martinet, Word 9, 1953, 258 fn. 23. — However late the gen. pl. ending may be, it is certainly pre-Hittite, as is shown by the fact that in Old Hittite the only gen. pl. ending for animate nouns is *-an*, and *-as* is a late development, see Otten, Wissenschaftliche Annalen 2, 1953, 327. For a possible trace of *-ŏm* in Tokharian, see Winter, Language 31, 1955, 108.

CHAPTER VI

The IE numeral system compared with that of the Finno-Ugric and Semitic languages

Turning now to the characterization of the Indo-European numeral system as revealed in the course of this study, we may note the following important features.

The cardinals 2 — 10 represent a class of "unmotivated" words. Its members have no transparent connections with other members of the IE vocabulary, at least not in the synchronous system of Late-IE, although we might be able to suggest cognates that were felt to be such by the speakers on an earlier chronological level. Such remote kinship is possible for, e. g., **penkʷe* "5", **Hweks* "6", **newn̥* "9", **dekmt* "10". It is often asserted that **oktō* is the dual of "4" but, however much one would like this to be the case, the attempts to reconcile this wish with the actual form remain unconvincing[1]. The remaining numerals still defy all rational analysis.

The next major group, the set of decads "20 — 90", is remarkably clear. It consists of compounds describing the numerals with great precision as "two ten(s)", "three ten(s)" etc. Even "100" partakes of this rational structure if our interpretation of **kmtom* as "ten (of) tens" is correct; the current view is certainly less clear.

One further feature that distinguishes the set "20 — 90" is that its members do not present inflected phrases as is usually assumed. But this does not necessarily mean that the formation must go back to a preflexional period, although it well might. There is something rather unrealistic about the assertion that the fact that only "1 — 4" are inflected in Indo-European proves that by the time "5" and the other numerals were formed, Indo-European had a (fully ?) developed inflexional system, which implies, e. g., that **penkʷe* had a "grammatical form"[2]. One might remark that from the same facts the exact opposite could equally well be, and has actually been, concluded, to wit that "2 — 4" and in particular

[1] See, e. g., J. McKenzie, Leeds Studies in English and Kindred Languages 6, 1937, 1 — 4; A. S. C. Ross, TPS 1941, 12; and most recently E-A. Ebbinghaus, PBB 72, 1950, 319 — 320, followed by Rosenfeld, Zahlen 208 A.

[2] Nehring, WS 12, 1929, 264 f., 284.

"1" were the last numerals to be formed, at a time when we can already speak of a fully developed inflexional system; "5 — 9", created before, were left without inflexion[3].

The clear pattern of ordinal formation in Indo-European is also worth noting. Here again the formation may go back to pre-flexional times — in which case *-o-* is merely a derivational element — but need not.

The peculiar features of Indo-European numeral formation are illuminated by a comparison of the numeral systems of adjacent linguistic groups, in particular of those of the Finno-Ugric and the Semitic languages.

In the Finno-Ugric group, Hungarian may serve as a useful basis to start from. The relations between digits and decads in present-day Hungarian are shown by the following list:[4]

1 egy	*10 tíz*
2 két/kettő	*20 húsz*
3 három	*30 harminc*
4 négy	*40 negyven*
5 öt	*50 ötven*
6 hat	*60 hatvan*
7 hét	*70 hetven*
8 nyolc	*80 nyolcvan*
9 kilenc	*90 kilencven.*

In this synchronous system the formation is at its clearest in the set "40 — 90" where, from the descriptive point of view, we find *-ven/-van* added to the digits. This "suffix" is paralleled by Vogul *-men/-pen* in *nälmen* "40": *njele* "4", *ätmen* "50": *ät* "5", *chotpen* "60": *chōt* "6"; by Ziryene *-myn* in *njeljamyn* "40": *njolj* "4", *vetymyn* "50": *vit* "5", *kvaitymyn* "60": *kvait* "6"; by Votyak *-myn* in *kwamyn* "30": *kwinjm-* "3".

"30" shows a very different type, but it is perceptibly based on "3" and an element meaning "10". This is usually identified with *-mys* appearing in Ziryene decads from "40" (!) onwards: *njeljamys* "40", *vetymys* "50", *kvaitymys* "60" (all beside *-myn* mentioned above) and in the Ziryene and Votyak numerals for "8" and "9" (that is "10 — 2", "10 — 1"): Z. *kykjamys, okmys*; V. *tjamys, ukmys*.

[3] This is Cuny's view, La catégorie du duel dans les langues indo-européennes et chamito-sémitiques, 1930, 42.

[4] For the following discussion cp. J. Szinnyei, Finnisch-ugrische Sprachwissenschaft (= Sprw.), 1910, 107 f.; Magyar Nyelvhasonlítás (= Nyhas), 1927[7], 56, 139; G. Bárczi, Magyar Szófejtő Szótár, 1941, s. vv. In the simplified transscription of FU dialects I have followed Bárczi, p. XVII.

No explanation is offered for Hung. *húsz*, which agrees with Vogul *chus* and Ostyak *chus*.

In spite of the numerous dark spots in this system, it is clear that the Finno-Ugric languages agree with the general Indo-European pattern: the decads are compounds, consisting of the respective digit and a noun "ten". But before leaving Finno-Ugrian, it is tempting to examine a few points of this numeral system, especially as the results obtained in the Indo-European field seem to throw light on certain of its problems[5].

What strikes most the Indoeuropeanist approaching the Finno-Ugric system, is the plethora of words for "10". According to Szinnyei[6] there are nine forms meaning "ten", five used for "10", four appearing only in compounds, and his classification is followed by Ross[7]. To be sure, not all of them are ascribed to Primitive FU. Thus *deksan* appearing in Finnish *kahdeksan* "8", *yhdeksän* "9" is borrowed from IE **dekm̥*[8]. Similarly, Ziryene and Votyak *das* "10" are from Iranian *das(a)*[9], and the same is true of Hung. *tíz* "10"[10]. Vogul *low* "10", Lappish *lokke/loge* "10" is regarded as a loan from Indo-European by Collinder (: Gk. λέγω "collect, count" etc.), while Ross has suggested Tungus as the source of Ostyak *jang* "10"[11].

But as far as the decads are concerned, the real problem is the number of different forms appearing as the second member in them. We have already met Hung. *-ven/-van*, paralleled by Vogul *-men/pen*, Ziryene *-myn*, Votyak *-myn*; we have noticed *-mys*, and we can add (Votyak) *-don/-ton* in "40 — 90". It seems to me that this variety overlays an earlier single principle.

If we take "30", we find Hung. *harminc*, Ziryene *komyn*, Votyak *kwamyn*. Now these are obviously based on "3", (Hung. *három*, *hárm-*, *harm-*; Ziryene *kujim*, Votyak *kwinjm*, all derived from) **kolm-*, and it seems natural that the morph expressing "(thir)ty" should be *-yn* rather than *-myn*[12]. This conclusion is perhaps supported by the fact that "10"

[5] The following remarks are not meant as final solutions. Rather are they an invitation to Finno-Ugric specialists to examine their validity.

[6] Sprw. 109 f.

[7] TPS 1941, 14.

[8] See Ross TPS 1944, 84, 89; L. Hakulinen, Razvitije i struktura finskogo jazyka II, 1955, 37.

[9] Szinnyei, Sprw. 109; Ross, TPS 1944, 82 f.

[10] In spite of Ross's scepticism, TPS 1944, 49; see Szinnyei, Sprw. 109; Bárczi, 311.

[11] B. Collinder, Fenno-Ugric Vocabulary, 1955, 131; Ross, TPS 1944, 87[4].

[12] Collinder's suggestion (o. c., 133) that *-myn* = Finn. *moni* "many" is impossible.

is *on* (alternating with *-an/-en*) in the Altaic languages[13]. If this is true, the following decads have *-myn* from "30" by false analysis, say Hung. *harm-yn* interpreted as *harm-myn*, while Votyak has, in the set "40 — 90", *-don/ton* falsely abstracted from "50 — 60".

The Ziryene variation *-myn* ~ *-mys* also becomes intelligible if we look at the set "70 — 90": *sizimdas*, *kykjamysdas*, *okmysdas* have an *-s* (they are later innovations with *das* "10") which affected the final *-n* of the preceding decads "40 — 60".

I have deliberately ignored the fact that in Old Hungarian "30" is *harmic*, not *harminc*, because I regard *-mic* as the (genetically) later form, as shown by its *-c*; the present view has in any case to contend with the difficulty of explaining *-c* = [*ts*] from the assumed ending *-mys*. Now Hung. *húsz* "20", agreeing with Vogul and Ostyak *chus* — which are all unexplained — must be based on the digit Hung. *két* "2", Vog. *kit*, Ostyak *kät*. The fact that the digit has *k-*, but the decad *h- ch-*, is a secondary development and certainly not a primeval difference[14]. It is equally clear to my mind that the remaining *-s* must represent the remainder of Hung. *tíz*, from an earlier *das* (or **des-* ?), i. e. *-ts* with assimilation to *-s(s)*. The change of original **harmyn* "30" to *harminc* or *harmic* is thus due to "20"[15].

This also means that the current interpretation of Hung. *nyolc* "8", *kilenc* "9", as showing in *-c* the FU "10" found in Ziryene and Votyak *-mys* cannot be upheld; the derivation is disproved in any case by the fact that Hung. *nyolc* = Ostyak *njȳlych* show no trace of *-my-*. But the only reason for this interpretation is the observation that in many FU languages (Ross says all) "8" and "9" are subtractives. Even so, Bárczi can only suggest for *nyol-* an original "nose, protruding part" so that "8" was the "numeral farthest from (or this side of) ten (over seven!)", while Ross regards it as of "unknown provenance"[16]; the former suggestion is obviously hardly any more satisfactory.

Now Vogul and Ostyak are, in addition to Lappish, the only group of

[13] See G. J. Ramstedt, Einführung in die Altaische Sprachwissenschaft II, Formenlehre, Helsinki 1952, 64 = Vvedenije v altajskoje jazykoznanije — Morfologija, Moscow 1957, 66.

[14] See W. Steinitz, Geschichte des finnisch-ugrischen Konsonantismus (Acta Instituti Hungarici Universitatis Holmiensis, Ser. B., Linguistica I, Stockholm 1952, 15 — 40), p. 20 f.

[15] Mordvin *kom(y)s* "20" does not prove an independent *mys* "10" but owes its ending to "30".

[16] Bárczi, 219; Ross, TPS 1944, 86. Szinnyei, Sprw. 109, only says that 'eight' and 'nine' are "mostly" subtractive.

the FU family, in which the old dual still survives. And it so happens that the dual suffix has a velar spirant (*gh* or *ch* in Bárczi's notation) as its main characteristic. Thus, e. g., Ostyak has *chot* "house": *chotchyn* "two houses". Vogul *āmp* "dog": *ampygh* "two dogs" shows that the Ostyak form has a secondary *-yn* added, the original being **chot-ych*[17]. Now Ostyak *njȳlych* is in so close an agreement with this type that the conclusion seems inescapable that it is the dual of "4", i. e. *njel*[18].

Hungarian *nyolc* "8", together with *kilenc* "9", shows the *-s* of the original *das (des)* "10"[19]. And what is *kilenc*? Ossetic *farast* "9", i. e. "(one) over eight" might suggest **ki-nyelc*, changed by metathesis to *ki-leńc*, where *ki* is the adverb surviving in *kinn* "outside" and the preverb *ki-* "out" (*kimegyek* "I go out"). On the other hand, an analysis *kinen-t(i)z* "outside ten", with subsequent dissimilation of the two nasals to *l-n*, cannot perhaps be rejected out of hand. One thing is certain: Finnish *kylke* "side" cannot explain the numeral[20]; nor does it contain an imaginary *-mys* "10".

But to return to our main theme. As has been seen, the Finno-Ugric decads show a type which is identical with that of the Indo-European languages.

A very different picture is presented by the Semitic languages[21]. There the digits are adjectives (1 — 2) or nouns followed by the gen. plur. of the object counted (3 — 10). The decads, however, were originally expressed by the plural of the digits, except for "20" which was the dual of "10". The result of the coexistence of the two numbers was that some languages (Akkadian, Aethiopian, South Arabic) extended the dual end-

[17] Szinnyei, Sprw. 60; Nesheim, Der lappische Dualis, 1942, 19.

[18] This result makes it very likely that there was a FU term for "7" also. If we add FU **on* "10", implying "9", there is no room left for the theory that Finno-Ugrian originally had a sextal system, a theory based on the assumption that there are no FU terms beyond the set "1 — 6" (Ross, TPS 1941, 10 f.; 1944, 49 — "though not common among the languages of the world", and, to my mind, even the two instances quoted are uncertain). One more heretical remark in this connection: the FU words for "6" (Finn. *kuut-*, Ziryene *kvatj*, Votyak *kwatj*, Vogul *chōt*, Ostyak *chot*, Hung. *hat*) seem to me to derive from **hvat(š?)*, i. e. the Pre-Iranian form of IE **sweks*, but I would not advocate a quintal system.

[19] As if in IE an original **newo* had become **newm̥* under the influence of **dekm̥*.

[20] It is mentioned as a possibility by Bárczi, 165. A third possibility is **kin-en* with *-en* = **on* "10", later influenced in its ending by *tíz*, or its forerunner.

[21] See C. Brockelmann, Kurzgefaßte vergleichende Grammatik der semitischen Sprachen, 1908, 232 f.; L. H. Gray, Introduction to Semitic Comparative Linguistics, 1934, 68 f.

ing of "20" to all decads (e. g. Akkadian *ešrā* "20", *šalāš-ā* "30", *erb-ā* "40", **ḫamš-ā* > *ḫanš-ā* "50"), while in the others "20" fell in line with the plural-decads, e. g. Hebrew *šᵉlōš-īm* "30", *'arbā'-īm* "40", *ḥᵃmišš-īm* "50", *šišš-īm* "60", *šib'-īm* "70", *šᵉmōn-īm* "80", *tiš'-īm* "90", and so also *'eśr-īm* "20" (: *'eśer* "10").

This is certainly a highly original system, and the Indo-European speaker finds it somewhat difficult to grasp the underlying principle. Moreover, Akkadian uses the dual as a sort of "pluralis paucitatis", even for a numerically limited plurality of objects, sometimes of ten; cf. *šinnān* "teeth", the dual of *šinnu* "tooth", and in particular *ubānān* "10 fingers/toes", the dual of *ubānu*[22]. So it is possible that the Akkadian dual-decads were not transformed from earlier plurals after all. But the plural-decads of the other languages seem well established. Whatever the explanation of these variations in detail, the basic principle stands out quite clearly and it could not be more different from that found in the IE (and FU) languages.

The ordinals call for little comment both in the FU and in the Semitic group. The FU languages employ a suffix *-nt/-nd-*[23]. E. g. Finnish *kolme* "3": *kolmas* (stem *kolmant-*) "3rd"; Vogul *chūrum* "3": *chūrmit* (stem *-int-*) "3rd"; Hungarian *három* "3": *harmad(ik)* "3rd". The Semitic languages resort to different types of internal ablaut. Thus Akkadian uses the type *qatul*: *šalaš-* "3": *šaluš-* "3rd"; *ḫamiš-* "5": *ḫamuš-* "5th". Hebrew and Aramaic have the type *qatīl*: Hebr. *šālōš/šᵉlōšā* "3": *šᵉlīš-ī* "3rd"; *'arbā'ā/'arba'* "4": *rᵉbī'-ī* "4th". All this does not differ very much from the IE principle of thematization and agrees with wide-spread practices in this grammatical category[24].

However, the gulf separating the IE and FU languages from the Semitic group in the formation of decads is truly remarkable. It is worth insisting on this point because, as far as I can see, it is usually overlooked in the debates about the genetic relations of Indo-European and Semitic. Those who uphold the view that Indo-European and Semitic are cognate[25], have to remove all the real characteristics of historical Indo-European and historical Semitic because in these the similarities are conspicuous by their absence. But if, having removed the inflexional marks, both

[22] W. von Soden, Grundriß der akkadischen Grammatik, 1952, 76 § 61 c.

[23] See Szinnyei, Sprw. 111.

[24] Cp. Benveniste, Noms d'agent et noms d'action, 1948, 145 f.

[25] E. g. H. Möller, A. Cuny; see L. Heilmann's useful survey "Camito-Semitico e Indoeuropeo", 1949, (with full bibliography) esp. 64 f. Add now J. Whatmough's remarks in his "Poetic, scientific and other forms of discourse", 1956, 65 f.

linguistic types are reduced to a collection of roots — very often to biliteral or even monoliteral roots at that — comparison becomes more easy. Yet, the system of numerals, which, on the Indo-European side at any rate, goes back to pre-ablaut and pre-flexional Proto-IE times, is so different both in substance — the phonic material — and in form — the principle governing the formation of decads — that the student of this particular field, however narrow it may be, fails to see his way to the broad generalization amounting to an Indoeuropean-Semitic kinship. On the Finno-Ugric side, for which similar claims have been made[26], this obstacle at least is absent.

[26] See, e. g., B. Collinder, Indouralisches Sprachgut, 1934; Zur indo-uralischen Frage, UUÅ 1955; La parenté linguistique et le calcul des probabilités, UUÅ 1948/13; but also H. Kronasser, Frühgesch. und Sprachw. I, 1948, 162 — 85; A. Sauvageot, Lingua 2, 1949, 40.

Appendix

1. Rosenfeld's theory of the Formation of Germanic decads

H-Fr. Rosenfeld's views on the origin of the Germanic, but not only the Germanic, decads, earlier presented in a very brief abstract only, have now been published in full under the title „Die germanischen Zahlen von 70 — 90 und die Entwicklung des Aufbaus der germanischen Zahlwörter"[1]. In view of the importance of the question, I owe the reader a somewhat fuller discussion of Prof. Rosenfeld's new work than has been accorded above (p. 31 f.) to his first paper. The theory can be outlined as follows.

After J. Schmidt's work it may be regarded as established („dürfte es feststehen", p. 182A) that, for the decads, Indo-European employed two types of formation: neuter plural juxtapositions (τετταράκοντα) and singular collective compounds of feminine gender. The latter type, with the digit as first member, appears in Indo-Iranian in the set "30 — 50". Greek and Latin, on the other hand, present the former type in "30 — 60", but in "70 — 90" it is "obvious" that the collective is coupled with the ordinal. "So far we can no doubt agree with J. Schmidt. But when he goes on to posit as the Primitive Greek form of "70" *ἑβδομο-κάς, we must say that he has failed to follow up his own idea to the end".

For, just as the type τριάκοντα shows full inflexion of the first member, the set "70 — 90" also presented an inflected first member, the feminine of the ordinal. The Pre-Greek form was, therefore, **septmā-kmt-s*, which gave *ἑβδ(ο)μᾱκας and, on the analogy of "30 — 60", *ἑβδομᾱκοντα. In Ionic-Attic -ᾱ- became -ᾰ-, which was then raised to the -ē- of πεντήκοντα and even produced the new ἑξ-ή-κοντα, while τετταράκοντα remained unaffected. But we know how important *genre*, and especially *Homeric epic*, was in Greece. No wonder that the other dialects also accepted the Ionic-Attic juncture-vowel -η-. The ordinal is also preserved in the Greek forms of "80 — 90".

Lat. *septuāgintā* and *nōnāgintā*, taken together with the Greek forms, also clearly indicate a type with the feminine *-kmt-s*. *Septuā-* is probably

[1] Wissenschaftliche Zeitschrift der Ernst Moritz Arndt-Universität Greifswald, Gesellschafts- und sprachwissenschaftliche Reihe Nr. 3 — Jahrgang VI, 1956/57, 171 — 215. I first saw a copy, courteously lent to me by Prof. M. Mayrhofer, on 21. 7. 1958, and subsequently (1. 8. 1958) received one from Prof. Rosenfeld himself.

from **septumā-*, although it is possible that the original **oktowos* produced **septuwos* which survived only in "70". Placed as it is between *septuāgintā* and *nōnāgintā*, *octōgintā* is surely secondary and represents either **oktowā-gintā* or **oktōwā-gintā*. "That *septuā-* is to be interpreted as an ordinal, whether from an inherited IE form, or on the analogy of the next decad, cannot be doubted so long as we cannot operate with a morphological vowel belonging with the second part, which might have influenced the ending of the cardinal. But there is *not the slightest reason* for assuming this" (183 B). On the contrary, *-ā-* is the old feminine ending which, in internal position, preserved its length.

OIrish *sechtmogo* derives from **septṃmu-komt-s*, where *-u-* represents the old feminine *-ā*, first shortened and then labialized by the preceding *m*. "80 — 90" also contain the ordinal. The same may be true of Tokharian.

So far the result is then that in Greek-Latin-Celtic "70 — 90" are formed with the ordinal as the first member and, what has so far been overlooked, with the feminine of the ordinal at that (185 B). The second member, originally, was *-kṃt-s*. In Celtic this was, after *-komtā* (in "30 — 60"), changed to *-komt-s*, but the inflexion is that of the non-neuter singulars. In Latin-Greek *-kṃt-s* was replaced by the ending of "30 — 60", but the first part continues the old feminine (almost) unchanged.

In Germanic, the ending *-hund* (of Gothic) shows that in "70 — 90" at least the second member was *-kṃt* originally. In view of the close connections between Italic and Germanic, it is almost certain that Primitive Germanic, like Italic, extended *-kṃt-* to all decads (cp. *trīgintā* etc.). At one time it had therefore, e. g., **trĭkṃtā*, where the ending, after the operation of Verner's law, became **hundō*. But this was identical with the plural of IE **kṃtóm* and so it became impossible to distinguish "3 — 6 tens" from "3 — 6 hundred" (186 A), an intolerable state of affairs. Even Latin had to find a way out of the difficulties of homonymy by dissimilating *k* to *g* etc[2]. Germanic proceeded even more radically. It introduced new juxtapositions with the digit preceding a full form of "10", **tegus*.

That this step was taken before the loss of the IE free accent, is shown by the *g* in **tegus*. "This is also suggested by the following consideration: it is very likely that the change in Germanic was effected in conjunction with Balto-Slavic, that is to say, at a time when, we may surmise, the close connections with Italic had already been broken off and, instead, those with Balto-Slavic had come to the fore" (186 B).

[2] On this question see Appendix 2.

There, too, the old type had to be given up, and for the same reasons. PrimSlavic **sęto* (allegro-form **sъto*) coincided with *kmt* in "20" and "70 — 90" which in Pre-Slavic, too, had probably been extended to all decads. This was as intolerable to the Balto-Slavs as it was to the Germanic peoples, and the same remedy was applied: to form new expessions for "20 — 90" the abstract **dekmt* was used which is masculine in this group of languages. Now Gmc. **tegus*, which also derives from **dekmt* (**tegum* from **tegundmiz*), is also masculine. But, whereas the Gmc. noun is based on the dat. plur., the Balto-Slav noun has a full consonantal inflection. Hence "ist es wahrscheinlich, daß das Prä-Balto-Slavische hierin (in the development of inflection) für das Germanische maßgebend geworden ist" (187 B). The assumption of such close contacts is, in Rosenfeld's view, supported by various loanwords from the area (e. g. *rye* etc.), although he acknowledges that *thousand* was offered in exchange, as it were, by the Germanic peoples (189 A).

Valuable evidence in favour of his assumption that *kmt* was extended to all decads even in Slavic is found by Rosenfeld in Russ. *devjanosto*. This is surely from **newenosęto*, IE **neweno-kmt*, and shows not only that the first member was the ordinal but also indicates, with its *-o-*, that *kmt* had become a masculine.

After a detailed survey of the Germanic data (189 B — 195), Rosenfeld finally submits that "the key to the explanation of the curious formation of the Germanic numerals 70 — 90 (— 120) is to be seen in the Old Saxon forms of the Essener Heberolle. They prove that the forms *antahtoda* of Heliand M, *ahtoda* of Heliand C, *antahtoda* of the Freckenhorster Heberolle are not, as is often assumed, merely spelling-adjustments to the ordinal *ahtodo* "eighth"; they prove that the form *ahtodo* was so firmly established that when the form was assimilated to the normal decads in *-tich*, *-tech*, *d* (or *-do*, beside *-da*) was safe from all change" (195 B). That a form of "80" in which "eighth" is contained is found over as wide an area as is indicated by the manuscript-sources mentioned above, is no coincidence, on the contrary. We have now solid ground under our feet: "80 is **hundahtoda* in Old Saxon, i. e. 'the eighth ten'" (195 B). Can the other decads of Old Saxon, and the forms of "70 — 90" in the other dialects, also be shown to contain ordinals ?

Rosenfeld admits that the form *nigonda* "90" of the Freckenhorster Heberegister, wich shows the regular ordinal, is an emendation by Heyne; the manuscript has *nichonte*. What is more, "it is clear at first sight that neither the other forms of OS, nor those of the other Germanic dialects present the regular (!) ordinals" (196 A). But a proper understanding of

the "linguistic position" of these forms can only be gained from an examination of the Gmc. ordinals.

As found in the earliest records, the Germanic ordinals represent a very recent stratum. Germanic is almost the only linguistic group in which there is no trace of the old thematic type **septṃmos*. It has completely reformed its system by introducing *-to-* (from **dekṃtos*) into the whole set "3rd — 12th". As a result of the sound-shift, this monolithic system was split again: *fimfta- sehsta- ainlifta- twalifta-* contrast with (Goth.) *sibunda ahtuda niunda taihunda*. But this neat distribution of forms with *-t-* and *-d-* (from *-tó-*) is not general: instead of *-d-* we also find *-þ-*, indicating an accent on the penult (e. g. WSaxon *siofoða* etc.). And this is not all. The numerous instances of analogical innovations in ordinals (surveyed in pp. 197 — 8) make it *a priori* probable "daß es auch in urgermanischer Zeit bereits Ausgleichsformen gab. Ein Beweis (!) dafür sind die Zahlen von 70 — 120" (198 A). The morphs (Goth.) *sibuntē- ahtautē- niuntē- taihuntē* etc. are ordinals like OS *ahtodo(ch)*, but ordinals formed on the analogy of *fimf-ta- sehs-ta- ainlif-ta- twalif-ta-*. In Gothic they are followed by *hund*, in WGmc. preceded. This hypothesis alone can offer an explanation of what previous theories have signally failed to account for, the ending. It is the normal masc. nom. sg. ending of the regular weak ordinal (198 A). Goth. *sibuntē* points to **sibuntēn* (199 A) which clarifies a further moot point: the original form of the weak masc. *-a* in Gothic. "Daß sie beim Ordinale und damit beim Adjektiv und gewiß überhaupt in der schwachen Deklination auf *-ēn* zurückgeht, erweist sich hier mit *voller Deutlichkeit*" (199 B). Traces of these ordinals in *-t-* are found, besides the decads 70 — 100, in England, esp. in the North, and Scotland; cf. *fourte, sevente, eigte, nente, tent*.

*

Since I have devoted much time and energy to the study of the intricate problems of the IE numerals, I feel I am fairly well equipped to appraise Rosenfeld's work. I would state first of all that many of his results are certainly definitive. Since in the above summary, quite naturally, only part of his results could be surveyed, I would point out that his explanation of *ant-* appearing in the OE and OS decads is, in my view, correct; his demonstration that Babylonian influence on the IE numeral system is mythical, is cogent; his discussion of the use of *hund* in singular and plural and of the development of the long-hundred is exemplary. Particularly interesting is to compare the critical appraisal of earlier attempts to ex-

plain the Germanic decads in Rosenfeld's work and the present book: there is an overall agreement in the arguments used by both authors, although I should add here that Rosenfeld's survey is much more complete and detailed. But I must also state, what must in any case be clear to the reader of the preceding chapters, that his theory of the origin of the decads 70 — 100 in Germanic, and 70 — 90 in other languages, is untenable, and that for the following reasons.

1. It is by no means "established" that Indo-European had inflected juxtapositions and compound abstracts side by side, see above p. 115 f. But even if the latter type were established, the theory that the first member of ἑβδομήκοντα etc. contains the ordinal, is unacceptable. There is no reason for supposing that there was a break, a switch from "six tens" to "seventh ten", especially when this construct is merely based on the apparently easy explanation of the element ἑβδομ-. In order to explain the voiced group -βδ-, Rosenfeld accepts the current view that *ἑβδομ- reflects an IE **septmo-* but fails to notice that such a form runs counter to the IE rules of syllabication (see above p. 6 f.). The cluster -βδ- does demand a Greek starting point in -πτμ- but this can, as far as I can see, only be provided by -πτμᾱ-, that is IE *-ptm̥̄-*. The lengthened sonant of the *cardinal* is in full agreement with *trī-* in "30", *kʷetwr̥̄-* in "40", *penkʷē-* in "50", and, I would add, *newn̥̄-* (or *newm̥̄-*) in "90". The same form **septm̥̄-* also accounts for Lat. *septumā-* which, instead of placing beyond doubt the ordinal theory, provides the key to the correct interpretation of the formation (see p. 8 f.).

It is of minor consequence that Rosenfeld thinks it possible that the Ionic-Attic juncture-vowel -η- was taken over by the other dialects because of the prestige of Homeric Greek (cp. above p. 9 f.). To anyone who knows the Greek dialects even superficially it is clear that the speakers of the other dialects were not at all impressed by epic Greek in their daily speech, especially not when it was a question of preserving such an outstanding shibboleth as their inherited *ā*. Of greater importance is the fact that Rosenfeld assumes for Greek formations in -κάς although there is not the slightest evidence that the Greek decads ever ended in anything else but -κοντ-. If there had been compounds in -κάς there can be little doubt that they would have been preserved since they had the great advantage of being declinable.

2. To turn to Germanic. The ending *-hund* is not capable of showing that originally "70 — 90" were of the type with *km̥t-*. The pressure of "10", "20", and "100" was obviously quite sufficient to change *χanþ* to *χunþ* in "30 — 90", see above p. 34. Nor can one agree that radical

changes were necessary because homonymy caused serious difficulties. The assumption that an original **trĭkmtā* "30" would have clashed with "300" is quite unfounded. Even if one accepts Rosenfeld's primitive form for "30" — which in my view is wrong since the form was **trīkomt* — the resulting **þrihundō* would never have been misunderstood as "300" since that was **þrī hundō* or **þriyō hundō* (IE *trī kmtā* or *triyā kmtā*), or possibly **þrihunda*^{n} (: Skt. *triśatam*), see above p. 40. The same applies to "40 — 60" which Rosenfeld merely mentions, without showing how they presented a case of "homonymie fâcheuse". That was certainly non-existent in **ƒemfēhundō* "50": **ƒemf(ĕ) hundō* "500", or **sehskundō* "60": **sehs hundō* "600", **ƒedurhundō* "40": **ƒedwōr hundō* "400". Generally speaking Rosenfeld is too ready to assume homonymic difficulties and underrates how little is sufficient to establish a clear "distinctive feature". An interesting instance is NPers *se* "3": *sī* "30", MPers *seh*: *sīh*, never causing any difficulty.

In order to pin down homonymy as the cause of the change in the system and of the introduction of expressions with **tegus*, Rosenfeld goes even further. Since it cannot be proved, he says, that "20 — 60" showed a uniform *-hund* (as they do in Lat. *-gintā*), he envisages the possibility that "20 — 60" (read "30 — 60") had, like the Greek forms, IE *-komt* (186 A). But in that case **komtō* (read **komtā*) would have given Gmc. **handō*. "Das war gewiß für die Sprache ebenso untragbar. Denn dies entsprach genau (!) *handu-* ‚die Hand'" (186 A). Here again one fails to see how *handō* could be exactly the same as *handu-*: what case-form of *handus* would have been *handō*? None, and therefore there would have been no homonymy.

3. The novel assumption that the development of a fully inflected **tegus* took place in Germanic under Balto-Slavic influence will hardly stand closer scrutiny. To begin with, Germanic never developed a "fully" inflected**tegus* : the singular is not found, only the plural. It would be very strange indeed if such a curious selective development were not due to internal needs and possibilities but to external influence.

Nor are the alleged loan-words, adduced by Rosenfeld to make the direction of borrowing more credible, fit to serve their purpose. Of the word rye, Rosenfeld states (187B) that originally it is a Thracian word, borrowed into Germanic as IE **rughyo-/rughi-* at an early date. But Lithu. *rugỹs*, ORuss. *rožь* "show that the word was borrowed independently into Balto-Slav". „Da das Wort vom Osten kam, ist es höchst wahrscheinlich, daß es von den Prä-Balto-Slaven aufgenommen und an die Prä-Germanen weitergegeben wurde".

I am once more perplexed by the argument. I cannot see how the Balto-Slav words show that they were borrowed independently, even if this be true. Nor can I admit that "since the word came from the East (the Thracian word is attested by Galen for Thrace and Macedon!), it is most likely(!)" that the Germanic peoples borrowed it from the Balto-Slavs. Furthermore, the etymon of Thracian βρίζα is anything but certain; I am inclined to regard it as cognate with Lat. *frūg-ēs*, from IE **bhrūg-*, in which case there is no connection with the Germanic and Balto-Slav words[3]. The other loan-words are admittedly much later and cannot prove early Balto-Slav influence on Germanic.

Rosenfeld also tries to prove Balto-Slavic influence by pointing out (187 f.) that in Germanic there was no reason for *tegus* becoming a masculine (**dekmt* being originally feminine) since there were also feminines in the *-u*-stem class, e. g. *handus*. In Slavic, on the other hand, *deseţ-* itself is originally a masculine and the element *kmt-* itself is shown to be masculine by **neweno-seto*, the primitive form of Russ. *devjanosto*[4]. Now the latter argument can be disposed of at once. If IE **neweno-kmt-* (189 A) is meant to be a real form[5], then it is a compound, and, as is known, *o*/*ā*-adjectives, as first members, use the stem-form in *-o-* independent of what gender the noun is. If, as is stated later on (189 B), *-o-* is „zweifellos das in der Fuge erhaltene, sonst im Auslaut geschwundene *-o* der Endung *-os* der mask. Adjektiva", then we can only ask whether such things have really happened in the Slavic languages. For the usual doctrine is that *-os* first became *-us* (before the loss of final *-s*!) and then *-u* (*-ъ*), so that Rosenfeld's explanation is impossible. Still, the problem remains: why has Slavic a masc. *deseţ-* when IE **dekmt* was feminine ?[6]

The answer is not very difficult. If we look at the *-nt*-stems in Slavic, it becomes clear that there are no feminine *-nt*-stems, for the simple reason that the only class where this suffix was used, the (present) participles, had the form *-ntī*/*ntyā-* for the feminine. This means that *deseţ-* could not remain a feminine and the choice lay between the masculine

[3] There is some evidence for Thrac. *ī* from *ū*, see Jokl, Reallexikon der Vorgeschichte 13, 1929, 286; D. Detschew, Charakteristik der thrakischen Sprache, Sofia 1952, 97.

[4] Incidentally, Rosenfeld never explains how his primitive form developed into the attested Russian form.

[5] But I do not believe in the existence of a **neweno-kmt-*, see above p. 63 f.

[6] Again I do not believe that **dekmt* was a noun and therefore had a gender; but when in later times the nominal use demanded a gender, the suffix *-t-* was sufficient to determine the choice.

and the neuter. If the form of the "nominative" was originally **desę*, then the neuter would seem to be the natural place for our noun. But, as is known, the ntr. *-nt*-stems consist of a closely knit group of nouns denoting the young of animals (*agnę*, *žrěbę* etc.). It is not surprising that the Slavs should have been reluctant to associate **desę* with this rather special group, and so the only gender open to **desę* was the masculine. If the nom. was **desъ*, the inflexion **desъ/desętъ/desęte* etc. left no room for any hesitation: only the masculine could accommodate this peculiar word[7].

This explanation also holds good for the "peculiar" gender-change in Germanic. Even if we accept Rosenfeld's view that it is difficult to understand why the newly developed *-u*-stem *tegus* should have been classed with the masculines rather than with the feminines, we need not look for external influence as the deciding factor. If we start from the assumption that the development of inflexion presupposes nominal use and therewith the attachment to a gender-class, we must conclude that the issue must have come to a head when there were only **téχunƀ/teχunƀ-mís* in existence as yet. This "paradigm" posed the same problem as Slavic **desъ/desęte*. In Germanic, too, there are no feminine *-nt*-stems, feminines have *-ntī/ntyā-*. But, in contrast to Slavic, Germanic has no special neuter group of *-nt*-stems, and thus only the masculine remained as a real possibility.

It is of course possible that the development was rather more complex. If, as I assume, at an early date only the dat-instr-abl. **teχunƀmís* was in use (see above p. 41 f.), then the speaker could only feel that this noun was non-feminine, without having to make up his mind whether it was masculine or neuter. But when the change to **tegumz*, and with it the transfer to the *-u*-stems, was accomplished, the gender had to become established as the masculine since the only neuters were the inherited **fehu* "animal", **kweru* "sting", whereas the masculines formed a large group which continued to be productive (cp. **fōt-u-s*).

[7] It is not, I hope, unfair to observe that, whereas the Gmc. masc. is held to be inexplicable and therefore warranting the assumption of Balto-Slav influence, when it comes to accounting for the Slavic masculine, Rosenfeld can only say that "das Zahlkollektiv *-kmt* im Slavischen zum Maskulinum geworden war, genau wie es das sekundäre *desętъ* ist. Ob wir uns das so zu erklären haben, daß dieser Geschlechtswandel erst eintrat, als bereits für die niederen Zehner das neue **dekmt-* aufgekommen war, und also das Geschlecht des konsonantischen Stammes *kmt-* sich nach dem maskulinen konsonatischen Stamme **dekmt-* richtete, oder ob umgekehrt der Geschlechtswandel bei *kmt-s*, *-ós* bereits eine Reaktion auf die Lautberührung mit **kmt-óm* war (?), und ob dann das neuaufgekommene **dekmt-* danach sein Geschlecht erhielt, müssen wir dahingestellt sein lassen" (189 B).

But the last consideration also shows that it is not necessary to go back to the consonant-stem stage in order to explain the masculine gender of *tegus*. Even when the *-u*-stem was fully established, the choice could not have fallen on the feminine. The feminine *-u*-stem class comprises two nouns all told: *handus* "hand" and *kinnus* "chin"[8]. It is a moribund class, unfit to receive a new member both on account of its low numbers and because of the meaning ("part of the body") of its members.

It is therefore clear that the masculine gender of *tegus/deseţ-* is not a mystery but due to very simple reasons inherent in the Germanic and Slavic inflexional systems.

4. To say that OS *(ant)ahtoda* holds the key to the explanation of "70 — 90" in *all* Germanic dialects is putting exaggerated faith in *a word* which may well have been secondarily transformed from an original **ahtota* — as is usually assumed — especially as in "70" and "90" we have, in accord with the data of the other dialects, *-t-*: *sibunta nichonte*. In the case of "80", i. e. **ahtota*, or even **antahtota*, the sequence of several *t*-s may in itself have been enough to provoke dissimilation. But the most serious objection is that whereas *sibunt- niunt- tehunt-* are explained as ordinals owing their *-t-* to the surrounding *fimft- sehst- ainlift- twalift-*, here we are asked to believe that an "old" *ahtod-* managed to escape the all-pervasive pressure of the system.

But the assumption that *sibunt-* etc. represent ordinals has itself no more foundation in the facts. No amount of illustrative material amassed to show that ordinals are subject to ("internal") analogical changes can obscure the fact that the Germanic languages show only one such act, the generalization of *-to-* before the operation of the sound-shift (see above p. 94). After that the mechanics of phonetic development again introduced variety: *-to-* is preserved after spirants but becames *-þa-*(later *-ða-*) otherwise. Rosenfeld tries to prove an even greater measure of variety by pointing to variations in the same ordinal between *-þa-* and *-ða-* in the different dialects. But this is simply accent-variation not (originally) suffix-variation, and we know how easily accent was affected in numerals by related forms.

To regard Middle English and Scottish ordinals in *-t-* as preserving something "uralt" (200 A) is really straining one's faith in the comparative method. To go on to declare that the "proof" of the *a priori* assumption that in Primitive Germanic the suffix *-to-*was (after the sound-shift!) generalized, lies in the decads "70 — 120", stands a good chance of be-

[8] Possibly also **kwernus* "quern" but this is very uncertain.

coming a classic example of circular argument but cannot be taken seriously.

5. Rosenfeld repeats the same kind of mistake when he declares that *sibuntē-* etc. present the regular masc. nom. sg. of the weak ordinal and then concludes that *sibuntē-* etc. "erweist mit voller Deutlichkeit" that the masc. nom. sg. of the *-n*-stems ended in *-ēn*. Scholars with a finer feeling for the niceties of the vicious circle might prefer to establish the latter point first, and independent of the question at issue, and then proceed to examine whether *sibuntē-* etc. can in fact be regarded as the masc. nom. sg. of the weak ordinal. Let us see then whether the ending of the masc. nom. sg. of *-n*-stems can be established for Primitive Germanic.

A. According to current doctrine the various Germanic dialects do not reflect one single type of nominative formation in the *-n*-stem nouns. Thus OE *guma*, OS *gumo*, OHG *gomo* are generally regarded as representing IE *-ō*, the sandhi-variant of IE *-ōn*. ON *gume*, on the other hand, is just as unanimously traced to IE *-ēn*[9]. Finally, Goth. *guma* is usually admitted to be ambiguous (both *-ēn* and *-ōn* are possible sources)[10], but, swayed by ON *gume*, most scholars decide in favour of *-ēn*[11].

Rosenfeld himself has now come out in favour of this view and, as we have seen, thinks that *sibuntē-* settles the issue. But in his earlier paper he argued rather differently (ZfPhonetik 8, 1955, 379 f.). There he maintained that while all WGmc. forms (OE, OS, OHG) derived from *-ō̃* (< *-ōn*), ON *-e* reflected *-ēn*, although he admitted (380 fn. 1) that (some) Finnish loanwords in *-a* might be borrowed from Nordic words in *-a* from *-ōn*; the latter is in any case guaranteed, even for Nordic, by the transfer of IE **nepōt-* to the *n*-stems (ON *nefe*). In contrast to the usual cleavage into WGmc. *-ō*: Nordic *-ēn*, we thus get a more flexible pattern in which Nordic possessed both types. With regard to Gothic *(gum)a* he admitted that both *-ēn* and *-ōn* were possible and stressed that the customary preference for the former, based on the close connections between Gothic and Nordic, was not cogent. But, he suggested, Germanic made use of the inherited types in *-ēn*, *-ōn*, *-ō̃* in building up its formally differentiated masc./fem./ntr. *-n*-stems; the fact that Nordic still showed *-ēn* and *-ōn* side by side, proved that the process had not been completed in

[9] Michels, IFA 1, 1892, 32; Streitberg, UG 253; Brugmann, Grdr.[2] II 2, 125; Hirt, Urgerm. II 53; Prokosch, Comp. Gmc. Gr. 251; Heusler, Aisl. Elementarbuch, 1950[4], 69; Gutenbrunner, Hist. Laut- und Formenlehre des Aisl., 1951, 100 f.

[10] E. g. Streitberg, l. c.; Brugmann, l. c.; Kieckers, Hb. der vergl. got. Gramm. 119; Prokosch, l. c.

[11] Streitberg, l. c.; Hirt, l. c.; Prokosch, l. c.; Krause, Hb. des Got. 155.

Primitive Germanic times. Now in Gothic the fem. and ntr. continue the type in *-ō̃* — in contrast to all the other Germanic dialects where the type in *-ōn* is used. This suggests, concludes Rosenfeld, that Gothic did so because *-ōn* was already pre-empted for the masculine. The type *sibuntē-*, of course, represents *-ēn* (385), so that for Gothic, too, we get both *-ēn* and *-ōn*. The result is, then, that while WGmc. has only *-ōn* and *-ō̃*, Gothic and Nordic have both *-ōn/-ō̃* and *-ēn*.

The Indo-European "basis" of this assumption is the doctrine that, like the *-r*-stems, the *-n*-stems could, in Indo-European times, have their nom. either in *-ēn* or in *-ōn*, with *-ō* as the sandhi-variant of the latter (*-ē* is not attested). The statement is usually supported with a reference to Gk. ποιμήν as if this settled the question. But even within Greek, the type in -ήν (gen. -ένος or -ηνος) is very limited, and the number of words that can be traced to Indo-European, as distinct from foreign loans and "obscure" words, is very small indeed: ἀρσήν, ἀρήν, αὐχήν, γερήν (?), λιμήν, ποιμήν, πυθμήν (?), φρήν (etymon?)[12]. The words with clear IE background usually have -ων: ἀγκών, ἀγών, αἴθων, αἰών, ἄκμων, ἄξων, ἀρηγών, ἡγεμών, περι-κτίονες, κύων, λειμών, τέκτων, τελαμών, χειμών; the adjectives γνώμων, μνήμων, πέπων, πίων, τλήμων; to which we must add the original *-m*-stems χιών, χθών.

The reason for this distribution is not clear. The often stated view that the accent-contrast seen in ποιμήν — ἄκμων shows that under the accent we have *-ē-* but if the accent recedes we get *-ō-* is flatly contradicted by such archaic words as χθών, χιών, *κυών (changed to κύων but see Skt. *śuvā́*)[13], and also by αἰών, ἀγών, ἀγκών, ἡγεμών etc. Kuryłowicz has recently tried to show that beside the unmotivated type with *-ē-/-e-* there was the motivated type with the paradigmatic alternation nom. *-ōn/* loc. *-en-i*, perhaps also gen. *-en-os*, and that the latter, by levelling, gave rise to the Greek types -ων/-ονος (-ων/-ωνος) and -ην/-ενος (-ην/-ηνος)[14]. This is, I think, very likely but it still does not account for the phenomenon as a whole.

[12] See Chantraine, Formation des noms en grec ancien, 1933, 158 f., 170 f.; Risch, Wortbildung der hom. Sprache, 1937, 50 f.; Schwyzer, Griech. Gram. I 486 f., 522 f. There is not a single clear, let alone IE, word in Schwyzer's group 3, p. 487.

[13] I cannot agree with Kuryłowicz (Accentuation des langues i-e., 1952, 19, 141 – 2), nor with Wackernagel-Debrunner (AiGr. III 278 bottom). Greek χθών shows that we do not need **śúvā* in order to explain *-ō-*. Cf. now Kuryłowicz, L'Apophonie en i-e., 1956, 36 f., esp. 37: "les changements de timbre sont conditionnés d'abord par l'entourage phonétique (!), l'accent n'y jouant qu'un rôle tout au plus secondaire".

[14] Apophonie 62 f.

Whatever the explanation of the Greek facts, it is more important in the present context that in the other IE languages of Europe, especially the Western IE languages which are most closely related to Germanic, the evidence for the type ποιμήν is nil. In Latin only the type *homō* is found; of the two "exceptions" the noun *liēn* is rather obscure, and so is *rēn*. Oscan-Umbrian has *-uf* from innovated *-ōns* in Oscan (e. g. *úittiuf*) and *-u* in Umbrian (e. g. *karu*). In Celtic too, the only type in use is that in *-ō*^{n}: OIrish *cú*, Welsh *ci* "dog" from **kū* < **kwō*[15]; W. *ych* "ox" < **uksō*; OIr. *brú* "belly" < **bhrusō*; *toimtiu* "meaning" < **to-mn̥tyō* = Lat. *mentiō*.

Thus the Southern and Western neighbours of the Germanic peoples only have the type in *-ō* (from *-ōn*)[16]. The same applies to their Eastern neigbours. Baltic and Slavic, too, have only this type. Note in particular Lithu. *akmuõ* "stone", gen. *akmen(e)s*, OCS *kamy*, *-en-e*: Gk. ἄκμων; Lithu. *šuõ* "dog" (from **švuõ*): Gk. κύων; OLithu. *žmuõ* "man" (now *žmogùs*): Lat. *homō*; Lithu. *širšuõ* (gen. *-ens*) "wasp": Lat. *crābrō* "wasp, hornet". Especially significant is the fact that the only cognate of Greek ποιμήν, found in Lithuanian, has the form *piemuõ* (gen. *piemens*), from **poimō(n)*. Contrast with this the fact that in the *-r*-stems Baltic has both *-ō(r)* and *-ē(r)*: Lithu. *sesuõ* "sister" — *duktẽ* "daughter", *motẽ* "wife". In Slavic we have, in addition to *kamy*, *plamy* "flame"[17].

We find then that the Germanic languages are surrounded by other IE languages (Italic, Venetic, Celtic — Balto-Slav) which have no trace of a variation *-ēn/-ōn* but only *-ōn/-õ*. And even within Germanic, the WGmc. group admittedly shows only *-ōn/-õ*. These facts of linguistic geography make one doubt whether it is likely at all that Gothic and Nordic had both *-ēn* and *-ōn*, or, worse still, only *-ēn*. What is more, it is generally acknowledged that Gothic *-a may* be traced to *-ōn*. Thus it is only Nordic that really "demands" *-ēn*.

In these circumstances one cannot but accept N. Lid's recent results which remove this anomaly[18]. He first points out that Urnordic *-a* of the

[15] K. Jackson, Language and History in Early Britain, 1953, 301.

[16] We can now add to this group Venetic whose independence of Illyrian is now well established; cp. *Moldo*.

[17] The Russ-CS and Serb-CS *korę* cannot be paraded as an example (rather the only example!) of the ποιμήν type (Vaillant, Slavia 11, 1932, 33 – 36; Gram. comp. des langues slaves I, 1950, 216). In view of its meaning ("root") it could always be affected by *sěmę* "seed").

[18] NTS 16, 1952, 237 – 40. Rosenfeld does not seem to know this paper. Krause (Hb. 155) cannot have considered the case seriously. Hamp also adheres to the old view (Studia Linguistica 13, 1959, 37).

Runic inscriptions (e. g. *gudija* "priest") in itself points to the type *-ōn* but this is usually explained away by stating that it indicates a "nasalized *a* with *e* timbre" — in order to reconcile it with the historical *-e*, *-i* of ON *gume*, *gumi*. But the earliest Finnish loans undoubtedly reflect *-ō*: Finn. *mako* "stomach": ON *magi*, OHG *mago*; *kallo* "skull": ON *skalli*[19]. This indicates then a development *-ō^n* > *-a*, just as the nom.-acc. sg. in *-a* of the ntr. *-n*-stems goes back to *-ō^n*. The ending *-a* in fact survives in such ON compounds as *blóðrisa* "bruised and bloody", *frumvaxta* "first-grown, in one's prime". In the *-jan*-stems, on the other hand, the nominative, originally *-jō^n*, later *-ia*, lost its *-a*, just as in the nom.-acc. pl. of the *-ja*-stems the original ending *-jō* became *-i*; cf. *kvæði* "poems" from **kvāþia* < **kwēþiyō*. During the period of syncopes, when *-a* of the pure *-an*-stems was threatened with apocope, *-i* was taken over, because the *-jan*-class was large from the outset and always remained productive.

In the light of these considerations it can be regarded as established that the whole of Primitive Germanic had only *-ōn*/*-õ* in the nominative of *-n*-stems[20].

B. This result is supported by the vowel-alternation in the derivative suffix, a point that, oddly enough, has not been noticed so far. The earliest paradigms of the masc.-*n*-stems are as follows:

Singular	Gothic	ON	OE	OS	OHG
nom.	*guma*	*gumi*	*guma*	*gumo*	*gomo*
acc.	*guman*	*guma*	*guman*	*gumon, -an*	*gomon, -un*
gen.	*gumins*	*guma*	*guman*	*gumen*	*gomen, -in*
dat.	*gumin*	*guma*	*guman*	*gumen*	*gomen, -in*
Plural					
nom.	*gumans*	*gumar*	*guman*	*gumon*	*gomon, -un*
acc.	*gumans*	*guma*	*guman*	*gumon*	*gomon, -un*
gen.	*gumane*	*gum(n)a*	*gumena*	*gumono*	*gomōno*
dat.	*gumam*	*gumom*	*gumum*	*gumon, -un*	*gomōm*

[19] Cf. B. Collinder, Die urgermanischen Lehnwörter im Finnischen, 1932, 77 f.

[20] H. Fromm says (ZfdA 88, 1957, 99[2]): "Dass das got. *-a* der mask. *-an*-Stämme *(hana)* nicht, wie z. B. Hirt, Handb. II 53 f. als ganz sicher annahm, sich von urgerm. *-ō^n* herleite, zeigte jüngst N. Lid". He cannot have read carefully either Lid or Hirt; the latter said (: o. c. 53 – 4): "*hana* kann . . . sicher aus **hanōn* hergeleitet werden . . . Da ich aber Bedenken habe, so habe ich ihn aus *-ēn* hergeleitet".

The gen. dat. sing. are presented in their inherited forms by Gothic and OS-OHG: gen. *-ens* from *-en-os*, dat. *-in* from *-en-i*. In contrast to these cases, the acc. sg. *-an* points to an earlier *-on-m̥*. The presence of the *-o-* grade, i. e. Gmc. *-a-*, in this case was to prove of great importance in OE and ON: in both, the dat. and gen. adopted this vowel, replacing the original *-ens*, *-ini* by *-an*: ON *guma*, OE *guman*. Nordic accomplished this change in the earliest phase already; cf. Runic gen. (or. dat. ?) *þrawinan* and the Finnish loanword *maanantai* "Monday" (i. e. moon's day) and dat. *wita(n)da-halaiƀan* "Brot-wart ?"[21]. This levelling is paralleled by a similar one in the *-a*-stems. There too, Gothic and OS-OHG present *-is/ -es* while Nordic has (Runic) *-as* and Early OE has *-aes*. This is often mechanically transposed into an IE *-oso*, in contrast to the *-eso* of the other dialects[22], but this is unjustified: ON and OE adjusted the gen. ending *-es* to the nom. *-as*, acc. *-an*. In a similar manner the OS-OHG acc. itself was analogically changed from *-an* to *-on* under the influence of the nom. *-o*; it is certainly impermissible to posit an (IE!) acc. *-ən-m̥* > *-un(um)* for the sake of these dialects[23].

The oblique cases of the singular must therefore be traced to the following IE paradigm:

acc. **ghm̥mon-m̥*
gen. **ghm̥men-os*
dat. **ghm̥men-i*

If we add now the nominative to this pattern, the current view leads to the following two paradigms:

	OE, OS, OHG	ON-Gothic
nom.	**ghm̥mō*	**ghm̥mēn*
acc.	**ghm̥mon-m̥*	**ghm̥mon-m̥*
gen.	**ghm̥men-os*	**ghm̥men-os*
dat.	**ghm̥men-i*	**ghm̥men-i*

The first paradigm is clear: nom-acc. have the *-o*-grade, gen-dat. the *-e*-grade. Although it does not recur in the same form elsewhere, it has a close parallel in Balto-Slavic. There the inflection of, e. g., Lithu. *akmuo*,

[21] Streitberg, UG 255 (: *þrawinan* gen., but Heusler, Aisl. 70: dat.); Krause, Runeninschriften im älteren Futhark, 1937, 538.

[22] Cp., e. g., Streitberg, UG 227; Prokosch, Comp. Gmc. Gr. 234; Rosenfeld, ZfPh 8, 1955, 381.

[23] As is done by Streitberg, UG 254; Prokosch 252; see Wessén, Zur Gesch. der n-Deklination (UUÅ 1914/2), 153.

acc. *akmenį*, gen. *akmen(e)s*, instr. *akmenimi*, closely agreeing with OCS *kamy*, acc. *kamenь*, gen. *kamene*, dat. *kameni*, clearly reflects a type in which nom. *-ōn* contrasts with oblique (and plural) *-en-*. The same is true of Lithu. *sesuo — seserį — seser(e)s — seserimi*, where again the nom. represents IE **swesōr*, while the oblique (and plural) cases show **sweser-*. Traces of a similar alternation are still found in Greek, although levelling has eliminated it from the living paradigm. Thus the adverb αἰέν is originally the locative of the noun αἰών and corresponds exactly with (Gmc.) **gʰm̥m-ōn*: *gʰm̥m-en-i*; αἰές and αἰεί also show the normal grade. The *-o-* timbre of ἀγκών contrasts with the *-e-*timbre of ἐπηγκενίδες. The same relation obtains between Λακών and Λακεδ-αίμων from *Λακεν-αιμων (*n-m-n* dissimilated to *d-m-n* rather than *l-m-n* because there is an *l* in the word already), and between χειμ-ών : χειμερινός from *χειμ-εν-ινος[24]. The alternation seen in πίων : πίειρα is no different. It is even probable that in the original paradigm, as in the Balto-Slav type, only the nominative had the *-o-*grade while the oblique cases had the normal (or zero) grade: *-ōn*, but *-en-m̥*, *-(e)n-os*, *-en-i*[25]. At least this seems the only way of explaining the curious discrepancy in what is obviously an inherited, archaic word, the word for "shepherd". The Lithu. *piemuo/piemens* and Gk. ποιμήν/ποιμένα can hardly represent two IE types: **poimōn* and *poimēn*[26]. It rather seems that the IE paradigm was **poimōn/poimen-m̥/poimen-os* etc., which is faithfully preserved in Lithuanian, but was modified in Greek by introducing the vowel-timbre of the oblique cases into the nominative[27].

[24] See on these Szemerényi, Glotta 38, 1959, 15. 123.

[25] Kuryłowicz (Apophonie 62 f.) does not go far enough.

[26] Kuryłowicz (Apoph. 66 fn. 39) is rather obscure on this point: "Li. *piemuõ* ne suppose pas nécessairement l'existence d'un **poimõn* puisqu' aucun thème en *-n-* n'a en lituanien conservé un nom. sg. en *-ẽ* (les thèmes en *-r-* opposent *-uo* à *-ẽ*, p. ex. *sesuõ*: *duktẽ*)". But this is exactly the point: why the difference between the stem-classes ? In spite of this Kuryłowicz goes on to say: "Le vocalisme suffixal de ποιμήν, différent de celui de lit. *piemuõ*, est le résultat d'un développement propre aux thèmes en *-n-* productifs (li. *piemuõ*: ποιμήν = δώτωρ: δοτήρ)". If *piemuõ* is not original, i. e. replaces **poimēn*, how is it different from the Greek form ? And if, as seems to be implied, the Greek vocalism is original, why do we have to explain it ?

[27] I do not mean to imply that in the *-r-*stems too, there was only *-ōr/érm̥* etc.; the evidence, I think, clearly points to *-ēr/-ōr*, although, I believe, *only* to *-er-m̥* etc., as in the *-n-*stems (not *-or-m̥* etc.). But in the nasal stems only *-ōn/-ōm* (but *-en-m̥* etc.) seems to have existed originally, and the *o-*colour may be due to the nasal. Note also Dor. πώς/πόδα/ποδός: Lat. *pēs/pedis*, pointing to **pōd-s/péd-m̥/p(e)d-ós*. I shall return to this problem elsewhere.

But whatever the more remote IE background of the *-n*-stem inflexion, it is plain that the pattern presented by OE, OS and OHG is a normal type: *-ō^{n}/-on-ɱ/-en-os/-en-i* is perfectly clear, whether *-on-ɱ* represents a refashioning of *-en-ɱ* under the influence of the nom. *-ō^{n}* or not. Can the same be said of the pattern presented on current theory by Gothic and Nordic? Obviously not. The presence of an acc. in *-on-ɱ* in a paradigm which only knows the *-e*-grade of the vowel is quite incomprehensible. If, as is usually assumed, the paradigm was of the type of Gk. ποιμήν/ποιμένα etc., then clearly **ghɱm-ēn/-en-ɱ/-en-os* is expected and there is no possible source for the intrusion of the *-o*-colour.

The matter becomes even worse if we turn to the plural. There all Germanic dialects admittedly reflect the following paradigm:

nom. **ghɱmon-es*
acc. **ghɱmon-ɱs*
gen. **ghɱmon-ōm*
dat. **ghɱmon-mis*

It is also generally agreed and quite plain that *-o-* cannot have been the vowel in all the cases from Indo-European times. But even if we assume that in the gen-dat. and acc. *-o-* is secondary, replacing the zero-grade, it cannot be removed from the nominative, partly because there a full-grade vowel is legitimate, partly because it is required in order to motivate the appearance of *-o-* in the oblique cases. Since a paradigm **ghɱmēn/ ghɱmon-ɱ/*plur. **ghɱmon-es* is unthinkable in Indo-European, the current reconstruction is proved to be false[28].

We would be faced with a, perhaps, slightly less difficult situation if we could assume that beside the type in *-ēn* Germanic also had *-ōn*, not in the same words of course. In that case one might perhaps suggest that the paradigm *-ēn/-en-ɱ/-en-os*, influenced by the alternative *-ōn/-on-ɱ/ -en-os*, innovated *-ēn/-on-ɱ/-en-os*, and also the plural *-on-es* etc. But even then it would be difficult to see why the clear pattern *-ēn/-en-ɱ/ -en-os* should have been blurred by an intrusive *-o-*.

In any case, even this difficult way out presupposes the coexistence of the two types, *-ēn* and *-ōn*, in (Pre)Gothic and Nordic. And at this point it is as well to recall that the type in *-ōn* must be assumed to have existed in these dialects for other reasons also. We have already seen that ON *nefi* must have developed from IE **nepōt(s)*, and since the basis of the transfer was an early Gmc. **nefō*, the transfer proves that there was a

[28] In my view the original paradigm was: **ghɱm-ōn*/acc. *-en-ɱ*/nom. pl. *-en-es*, transformed in Gmc. (or Late IE) to **ghɱmōn/-on-ɱ/-on-es*; cf. Glotta 38, 1959, 122.

group of *-n*-stem nouns with nom. in *-ō^n* even in Nordic. The same is proved by the word **mēnō* which started as **mēnōt(s)* and became ON *māni*. Now in Gothic the word **neƒa* is not attested, but *mena* "moon", besides *menoƀs* "month", is, and thus for Gothic too, we must assume the existence of *-n*-stems with nom. *-ō^n*.

It will be seen now that the question is not really whether *-ō^n*/*-ōn* existed in Gothic and Nordic but whether *-ēn* has to be assumed at all, in the face of the evidence of Western Germanic, and of Western Indo-European as a whole. We know that the main reason for the assumption of *-ēn*, for Nordic in the first place, was the ON ending *-i*. But now that this anomalous form has been explained satisfactorily, there is no need to assume an *-n*-stem nom. in *-ēn*, not even as a variant.

The interrelations presupposed by the vowel-variations in the Germanic *-n*-stem paradigms and the facts of linguistic geography thus combine to prove that throughout the whole Germanic area the nom. sg. of masc. *-n*-stems was *-ōn* or *-ō^n*; *-ēn*, if it ever existed, was eliminated long before Primitive Germanic times.

* * *

To sum up. Rosenfeld's theory is based on the following assumptions:

1. The Greek, Latin, Celtic cardinals "70 — 90" are derived from inflected phrases meaning "seventh decad" etc.;

2. This type also existed in Pre-Germanic, but the second part, becoming identical with "100" in PrimGmc. development, caused the introduction of a new system;

3. The new system was based on the innovated **tegus* "decad"; this itself owes its gender and inflection to Balto-Slav influence;

4. The first members in Gmc. *sibuntēhund* etc. represent ordinals;

5. *-ē-* in Goth. *sibuntē-hund* etc., *-ō* in OHG *sibunzo* etc., show the masc. nom. sg. of *-n*-stems: Gothic from *-ēn* etc.

In his first article, Rosenfeld claimed as a distinctive merit of his theory, setting it off from all previous attempts, that it "nur mit vorhandenen Grössen arbeitet, nicht mit idg. Konstruktionen: zu dem idg. Vorbild, das im Griechischen und Lateinischen vorliegt, treten rein germanische Mittel und rein germanische Formenkategorien — und alles erklärt sich glatt und einfach" (ZfPhon 8, 387 fn. 1). After the detailed examination above of the five assumptions necessary for his theory we can hardly subscribe to this claim. Each one of them has proved to be, not only far

removed from the facts, but in contradiction to them. The last two points in particular are at gross variance with the facts of the Germanic system. But he builds on no safer foundations when he assumes (point 1) that some European languages show a system of decads with ordinals as first members. Rosenfeld feels that his theory is inescapable because Sommer has not explained the origin and function of the element *-ē-/-ā-* found in Greek and Latin[29]. As is clear from Chapter I of this work, *-ā-* in Latin is due to long sonants (*m̥̄* > *mā*, *r̥̄* > *rā*), which eliminated the inherited *-ē-* of **penkʷēkont*, while in Greek the latter prevailed over the newly developed *-ā-*, or, in Attic-Ionic, coincided with it.

In view of these results we must, I believe, regard Rosenfeld's theory as untenable on all counts.

2. The Latin morph *-gint-*

Among the many problems presented by the Latin system of numerals not the least difficult is the unexpected appearance of *-g-* in place of IE *k* in the decad-morpheme *-gintā* but also in some of the hundreds such as *quadringentī quingentī* etc.

Some scholars, despairing of a solution, project the voicing into Indo-European. Sommer thinks that Albanian *-zet* "20" shows the same voicing and thus justifies tracing the phenomenon to Indo-European[30]. This view has recently been attacked by Eqrem Çabej[31] on the grounds that "*zet* as such does not exist, it is an abstraction of the linguist" (206); the actual forms are *njēzet*, Geg. *njizét* "20", *dyzét* "40", and since these are clearly "one twenty" and "two twenties", it is impossible to compare *-zet* with **wikm̥ti* which has *-km̥t* "10" (207). I must confess that I cannot quite see the logic of this argument. If the modern expressions for "20" and "40" do mean "one twenty" "two twenties", then there is surely no difficulty in taking *-zet* as the representative of IE **wīkm̥tī* — if this is possible phonetically[32]; I must also confess that Çabej's suggestion that *-zet* is a noun **yeuk-t-* "coupled, pair (of tens)" (= ζευκτός!), does not seem more attractive than the view rejected by him.

[29] Zahlen 214 B — a criticism with which I agree, see above p. 5 f.

[30] Handbuch der lat. Laut- und Formenlehre, 1948²·³, 467. Cf. G. Meyer, Etymol. Wb. der alban. Sprache, 1891, 483.

[31] ZfPhonetik 9, 1956, 206 f.

[32] Cp. Ossetic (Digor) *insaej* "20", *duvinsaedzi* "40" (2 × 20) etc.

Nevertheless, I do not think that Albanian matters in the present case, and that for the simple reason that the Latin voicing is strangely selective. While the cardinal decads all have *-gintā*, among the ordinals and their associates (multiplicatives and distributives) we have *uīcēsimus*, *trīcēsimus* etc. This could not be the case if Lat. *-g-* in the forms in which it occurs were due to voicing in IE times since the ordinals etc. as derivative forms would in that case likewise show the voicing. As it is, the ordinals etc. must be regarded as survivals of the original state of affairs while the cardinals present a Latin innovation[33].

Starting from this assumption Thurneysen suggested that the voicing was due to the particularly favourable environment that appeared in certain forms[34]. Thus *septm̥ kn̥tā* "700" and *newn̥ kn̥tā* "900", where *k* was between two sonant nasals, regularly developed into *septingent- nōngent-* and the type was extended to *quadringent- octingent-*, and, I would add, *quin(que)gent-*. But he realized that a group of hundreds could hardly be expected to influence the decads. He assumed therefore that the decads owed their *-g-* to the same phenomenon in the ordinals. These, based as they were on the weakened stem *kn̥t-* (not *kont-*), yielded the series **wīkn̥tto- *trīkn̥tto- *quadrukn̥tto- *quen(que)kn̥tto- *sekskn̥tto- *septm̥kn̥tto- *oktōukn̥tto- *newn̥kn̥tto-* in which, as in the hundreds, "70th" and "90th" developed into **septn̥gn̥tto- *newn̥gn̥tto-*. The latter then changed to **nongensumus* and on the analogy of **nōnākintā* (from *nowen-ā-*!) to *nōnāgēnsumus*, whereupon the cardinal itself became *nōnāgintā*, and "70" *septuāgintā*. These two decads, perhaps supported by **quingensumus*, carried *-g-* through the whole system — only *uīcēsimus trīcēsimus* were never quite eliminated[35].

One of the obvious objections that can be raised is that the majority is assumed to have succumbed to a minority, the numerals more frequently used (20 — 50) to those much more rarely employed (70, 90). Pointing out this difficulty, Endzelin advanced the view[36] that the voicing occurred in syllables not accented in the three-syllable system where *k*, surrounded by two voiceless stops, by dissimilation became *g*. These conditions are met by the decads "30 — 80" and the hundreds 400, 500,

[33] The view that *-g-* is an IE doublet, is also voiced by Kent, Sounds § 130. IV, Forms § 335. Meillet-Vendryès, Gram. comp. des langues class. 69, also point to ἕβδομος and ὄγδοος, implying an IE date.

[34] KZ 26, 1883, 312 f.

[35] Leumann (Leumann-Hofmann 293) presents this view but with no great confidence; see also p. 171.

[36] KZ 65, 1938, 134 – 7.

700, 800. So *trīgintā* from **trīkintā* is clear and we can now see why *trīcēsimus trīcēni trīciēs* kept their *k*. Analogy operated in *uīgintī nōnāgintā nongentī*. Instead of *trecentī* one would also expect **tregentī* but here *ducentī* was too near to allow the dissimilation to occur. In *quadrāgintā* and *quadringentī* the double dissimilation is probably not due to one single act but in the original **quatrākintā, -inkentī* first one stop (*t* or *c*) was dissimilated phonetically and then the other by analogy. He also thinks that the stabilization of *-gent-* was supported by the adjective *in-gent-* (!).

Rosenfeld, who seems to be unaware of Endzelin's paper, also operates with dissimilation but of a rather different type[37]. In his view, in the original Latin system of decads, where the ending *-kṃtā* had been generalized, instances of near-homonymy began to show themselves. Thus, e. g., **trīkṃtā* "30" differed from **trikṃtoi* "300" almost only in the ending, and was almost identical with the neuter **trikṃtā*. This was "ein unhaltbarer Zustand". As a first remedy, the decads from "30" onwards adopted the *i* of *uīgintī*, giving the more differentiated *-kintā*. But homonymy, or the fear of it, explains also a change that probably occurred even earlier, the voicing of *k*: "es war eine Ferndissimilation gegenüber den Hunderten als Notwehr der Sprache" (184B). This is best shown by the fact that the ordinals *uīcēsimus trīcēsimus*, where the hundreds had sufficiently differentiated forms (*-centēsimus*), were not affected. But even this was not enough. The hundreds themselves began to "move further away" from the decads: *quin(que)kentoi septinkentoi* were followed by *quadrinkentoi oktin-kentoi* and their *-in-* sharply separated them from the decads which meanwhile had acquired the juncture-*ā-*. At this stage the dangers were so remote that the hundreds could now safely introduce *-g-*, due to the surrounding nasals but also to the analogy of the decads; it is significant, however, that *-g-* appears only in forms that have *-in-* (*quadringenti* etc.) and thus are distinct.

* * *

I agree with Endzelin that the basis of Thurneysen's theory is far too slender. I would also add that if, in the decads at any rate, the movement started with the ordinals, then it is rather surprising that *uīcēsimus trīcēsimus* escaped the pressure but *uīgintī trīgintā* succumbed to it. It is also doubtful whether the ordinals "70th" "90th" were really in use at

[37] Zahlen 184.

the time required. If they were, "90th" cannot have been **newn̥kn̥tto-* when "90" was **nowenākintā*, and the same applies to "70th" and "70".

Endzelin's own theory operates with a factor that is otherwise inoperative in Latin. If **quatrātus*, e. g., became *quadrātus*, how could *(pater) patrātus* resist the pressure, especially as it must have been as obscure etymologically to the ancients as it is to us. But I admit that if there is no better explanation, Endzelin's must be given serious consideration. Rosenfeld's theory, on the other hand, strikes me as rather mystical. The "threatening" homonymy seems quite unreal, and if it was so alarming, it would not have been beyond the resourcefulness of Latin to introduce phrases with the noun **dekent-* (say *trēs decentēs* etc.) to make quite sure that the speakers understood each other's calculations. As it is, the decads first introduced *-g-* to differentiate themselves from the hundreds, but later *-g-* intruded even into the hundreds.

*

Now it is significant that, in the hundreds at any rate, *-g-* appears only in those forms where there is a complete nasal environment, especially clear at the stage *-n̥kn̥-*. This surely suggests that Thurneysen was on the right track, even though his analysis of the decads led him astray. But if we confront the original decad-forms with the historical forms:

**kʷetwr̥̄kn̥t-*	*quadrāgint-*
**septm̥̄kn̥t-*	*septu(m)āgint-*
**newn̥̄kn̥t-*	*nōnāgint-*,

we cannot but conclude that the voicing of *k* must be due to the surrounding sonants. Moreover, the long sonant seems to have had a greater voicing force (obviously because the vibration of the vocal chords lasted longer) than the short one; only this can account for the fact that in **kʷetwr̥̄-* even the preceding voiceless stop became voiced, just as in Greek the form **septm̥̄-* resulted in ἑβδμᾱ- while **septm̥* gave ἑπτά[38]. It is possible that in gaining ground the new ending *-gint-* was helped by the number of voiceless stops with which other decads were endowed. Thus **oktōkint-*, placed between *septuāgint-* and *nōnāgint-*, may have "welcomed" the change to *octōgint-*, and likewise **quinquākint-*, under the

[38] In Latin, we might have expected *sebdmā-* but *septem* restored *septumā-*, while *quattuor* was too far removed from *quadrā-*.

welcome pressure of *quadrāgint-*. The further extension to **sexākint-*, and further down the scale, to **trīkint- *wīkint-*, needs no comment.

This also explains why we find *-g-* in the hundreds only in *nongenti octingenti septingenti — quingenti quadringenti*. The very fact that **oktō-kent-* is replaced by *octingenti*, and not simply changed to **octōgenti*, shows that for the speakers *g* was linked in this set to the presence of a nasal before and after *g*. Similarly, *quinquekentoi*, again probably aided by the presence of four voiceless stops, became *quin(que)genti*, producing in turn the analogical *quadringenti*. But we can also see that **ses-ingenti *tringenti *dingenti* were not very attractive possibilities.

If this line of approach is correct, then we can probably infer that the generalization in the decads of the morph *-km̥t-* instead of *-komt-* preceded this process, in other words is prior to the development of long and short sonants into *rā/nā/mā* and *en* respectively. The further change of *-ent-* to *-int-*, doubtless due to the peculiar structure of *uīgintī*, is even later. Graphically:

$$*k^{w}etw\bar{r}kont- > *k^{w}etw\bar{r}k\eta t- > *k^{w}edrāgent- > quadrāgint-.$$

The change from *kont-* to *-kn̥t-* is not to be ascribed to the (non-existent) morph **(d)km̥t-* but partly to **wīkm̥tī* and **km̥tom*, partly to the ordinals **wīkn̥tto- *trīkn̥tto- *kʷetwr̥kn̥tto-*, as was already perceived by Thurneysen.

3. IE **dekm̥t-* in Celtic?

As we have seen above, Meillet regarded it as an archaic feature of the marginal languages that for "10" and "10th" they possess forms without *-t*, i. e. **dekm̥* and **dekm̥mos*, whereas the central languages have **dekm̥t* and **dekm̥tos*[39]. We have tried to show that **dekm̥t* and its derivative **dekm̥t-o-* were general IE formations and that this type survives even in marginal areas, in Italic **dekento-*. It seems that a further relic is found in Celtic.

The Welsh place-name *Degannwy, Dygannwy* derives from PrimCelt **Dekantowyon* (*Arx Decantorum* is mentioned there in 812 A. D.) which in turn is formed from the tribal name *Dekantae*, attested in MWelsh *Dygant* and identical with the Δεκάνται of Ptolemy mentioned as inhabitants of Scotland (II 3, 8)[40]. Unfortunately, Ptolemy's form does

[39] See above p. 70.

[40] See R. J. Thomas, BBCS 7, 1933, 119; M. Förster, Der Flussname Themse, 1942, 235[3]. 817[1]; K. Jackson, Language and History in Early Britain, 1953, 39. 665.

not determine the stem of the name. It could be *Dekant-*, cf. the variation in *druidae/druides*, *Nantuates*/Ναντουᾶται, but it may also be an *-o-*stem, *Dekanto-*, cf. Κελτοί/Κελταί.

The OIrish (Ogam) genitive *DECCEDDAS*, from *Dekent-os* (= OIr. *Deichet*), is based on a stem **Dekent-* which is identical with the British *Dekant-*. Pokorny has suggested that in MAQI DECCEDDAS the word *maqi* indicates the cult of a mythical *Dekents* (OIr. *Deiche*)[41]. If this is true, he is probably a pseudo-eponymous hero of the tribe of the *Dekantae*.

Now the stem *Dekant-* can hardly be connected with anything else but IE **dekm̥t*. Theoretically, it could be the same type as *carant- namant-*, i. e. a participial formation from a (verbal) stem, but there is no suitable (verbal) stem. On the other hand, the interpretation as a numeral has such parallels as the Gaulish tribal name *Vocontii*, whether it is connected with "20" or merely with *kont-*[42]; and the name *Cantii*, probably "hosts, armies", from **kant-* "100"[43].

The Gmc. name *Tuihanti* should also be noted in this connexion. It appears in two altar-inscriptions, found near Housesteads by Hadrian's Wall, dedicated to *Deus Mars* by Tuihanti, described in one as *Germani*, in the other as *cunei Frisiorum*; they date from the middle of the 3rd c. A. D.[44] It has been established that this tribal name survives in the Dutch place-name *Twente* (near the Zuyder Zee), paralleled by *Drente*, early *Thrianti*. The parallelism obviously suggests a division *Twi-hant-* ~ *þri-hant-*, with the numerals "2" and "3" as the first members. For the second member v. Helten suggested a Gmc. **hanta-* which he based on OCS *sǫdъ* "iudicium"[45]; he interpreted the name as "Bewohner eines zwei Gerichtsbezirke umfassenden Gaues". Von Grienberger attacked this on the grounds that *sǫdъ* was borrowed from Gk. σύνοδος and that the earliest forms of *Drente* (e. g. *Threant*) had no *h*[46]. The latter remark is beside the point since the earliest form, *Tuihanti*, does have an *h*; the etymon of *sǫdъ* is also wrong, but so is v. Helten's[47]. Gutenbrunner also assumes the meaning "Gau" for *hant-* and compares Irish *cond* "Bürger",

[41] Pokorny, Antiguo Irlandés, Madrid 1952, 25. On the form see also Jackson 140.

[42] See above, Ch. III, p. 55 fn. 70.

[43] Cf. Jackson, JRS 38, 1948, 55; Pokorny, IEW 527.

[44] See Brunner, Zeitschrift der Savigny-Stiftung für Rechtsgeschichte, Germ. Abteilung 5 (18), 1884, 226 f.; K. Scherling, RE VII A, 1939, 782 – 4.

[45] PBB 27, 1902, 152 – 3; v. Helten only mentions *sǫditi* "to judge" and *sǫdiji* "judge". His is the only view to be mentioned by A. Bach, Deutsche Namenkunde I, 1952², 306.

[46] IFA 32, 1913, 52.

[47] See Vasmer, REW sv. *sud*; Trautmann, Baltisch-Slavisches Wb. 47 f.

Gaul. *Seno-condus*, *Condus*, *Condo-Magus*[48]. But an OIrish *cond* "Bürger" does not exist — it is recorded by Holder s. v. *Condus* as d'Arbois de Jubainville's idea — while the Gaulish names are probably to be interpreted as "den Verstand eines Alten habend" (Thurneysen, or perhaps "Ancient Head", O'Rahilly), from MIr. *cond* "sense, head"[49].

In these circumstances it is worth pointing out that the closest parallels of the Germanic ethnic names seem to be provided by Gaul. *Vocontii* and **Tricontii*, the latter of course only in the numeral derivative (Gaul.) TRICONTIIS[50]. As far as the *t* of Tuihanti is concerned it can easily indicate Gmc. *-þ*. The Dutch *-t-* may be regular or due to analogical influences[51].

If this interpretation is correct, it is important in two respects at least. It supports the view that British *Dekant-* is a numeral. Beyond that it throws welcome light on the dark ages of the Germanic decads. For **þrihanþ-* would show that IE **trīkont-* preserved the vocalism of its second member in this name, while **Twihanþ-* would reveal that even the inherited **wīkm̥tī* changed its second vowel after "30" and the following decads and thus could provide a further possible source for the (WGmc.) change of *tehun* to *tehan*[52]; at the same time it would show that the inherited form of "20" was understood as "two tens" and filled out to **twi-*[53].

4. Is "9" IE *newn̥ or *newm̥?

In the main text I have accepted the current view that the IE word for "nine"was **newn̥*, with a final *-n̥*, not **newm̥* with *-m̥*[54]. But since this is by no means the *consensus omnium*, it will be useful to examine the evidence from this point of view.

We note at the outset that the only language that attests directly an IE **newm̥* is Latin with its *nouem*; Skt. *nava*, Gk. ἐννέα can be from *-n̥* or

[48] Die germanischen Götternamen der antiken Inschriften, 1936, 48.

[49] See K. H. Schmidt, ZCP 26, 1957, 266.

[50] Even Vendryès makes a slip when he quotes *Tricontii* as an ethnic name (Recueil de travaux offert à C. Brunel II, 1955, 647), providing a parallel for *Vocontii*. He inclines to interpreting *Vo-* as "double".

[51] Cf. J. te Winkel (Paul's Grundriss I², 1901, 838): "Im Auslaut wurde *þ* ausnahmslos (schon in geldrischen Urkunden von 720, 850, 855) dentales *t*, wiewohl im Nnl. meistens als *d* geschrieben, z. B. *mond*, mnl. *mont*, anfr. *munt* < *munþ*".

[52] See above p. 100 f.

[53] Cp. also what has been surmised above, p. 44.

[54] See p. 46 but also ibid. fn. 12; p. 89 f. with fn. 107.

-m̥, Gmc. **niun* shows the influence of **tehun*[55] and is also ambiguous. But the Latin is not unequivocal either. The ordinal *nōnus* and the higher numerals *nōnāgintā/nōnāgēsimus* contradict it. It is therefore customary to assume that the "true" IE form is preserved by *nōnus* while *nouem*, instead of **nouen*, is due to the influence of *decem* (and *septem* ?)[56].

Is there then any indirect evidence that might tip the balance in favour of an original *-m̥* ? In contrast to Latin *nōnus*, Celtic offers Gaul. NAMETOS, OIr. *nōmad*, Welsh *nawfed*; Aryan has *nawama-*. In both cases the *-m-* is usually explained as due to the influence of **dekm̥mo-* and **septm̥mo-*. This analogical origin is possible even if one does not admit an original **dekm̥mo-* but regards this as a secondary replacement of an earlier **dekm̥to-*. For in Aryan the inherited **oktŏwo-* was succeeded by **aštama-* for which **saptama-* was quite sufficient; compare the similar "restricted" extension in Slavic: **ostmъ* after **setmъ*. The group "7th — 8th" could then successfully exert its pressure on **nawana-*, changing it to **nawama-*, and then the new compact group "7th — 9th" was strong enough to produce **dašama-* in place of the old **dašata-*. The same could apply to Celtic where in that case the development was **sextamo-* → **oxtūmo-* → **nowamo-* → **dekamo-*. But it is clear that the development would be simpler and easier to understand if in both groups 'eighth' was subjected to pressure from 'ninth' as well, not only from 'seventh'.

In Latin, *octāuos* remained unaffected by *septimus* and so *nōnus* was not influenced either. But it will be noticed that in that case the innovated *decimus* could not have got any support from the preceding ordinal. From the Latin point of view, then, it is slightly more advantageous to assume that at the time **dekentos* was replaced by **dekamo-*, there was a model in **nowem*: **nowamo-* from IE **newm̥*: **newm̥mo-*. Later, however, the sequence *w-m* in the ordinal was dissimilated to *w-n*, hence **nowano-* and eventually *nōnus*[57]. This development could be regarded as certain if Umbr. *nuvime* really represented the ordinal "9th" but unfortunately this is by no means safely established[58].

On the whole then the forms of Italo-Celtic and Aryan are easier to understand if we start from IE **newm̥*, although it is not impossible to

[55] It does not, of course, represent an "Urg. **newunƀ*" as taught by Krause (Handbuch 176), and others before him.

[56] I have adhered to this view in the main text; see also my note in Glotta 35, 1956, 107[1].

[57] Saussure already assumed (Mémoire 30, after Curtius) that *nōnus* derived from *nōmus* < *noumos*. This would also apply to Gk. "90", see Rosenfeld, Zahlen 182 B.

[58] See above, Ch. III fn. 11, and Vetter, Handbuch der italischen Dialekte I, 1953, 197.

start from the alternative form. Much more difficult is to explain away the Tokharian evidence. The cardinal "9" is of course reduced to AB *ñu*, and the ordinal "9th" is B *ñunte*. But A *nmuk*, B *ñumka* "90" have an *-m-*, obviously the final sound of "9". Now while it is not impossible to explain this *m* by assuming assimilation of **newn̥* to **newm̥*[59], it seems more natural to accept *m*, which has no possible analogical source in the whole system, at its face-value and posit IE **newm̥* as its source. We must of course be aware of the risks involved in admitting the evidence of a "dilapidated" language such as Tokharian for the purposes of IE reconstruction. But in this case the Tokharian evidence is slightly supported by the indirect evidence of Aryan and Italo-Celtic.

There is one further point that can be adduced in favour of an IE **newm̥*. If we accept the old suggestion that, in the primitive IE system of counting, "9" represented the "new" unit after the stop at "8"[60], then the original can hardly have been anything else but **newom* which later became **newm̥*, either by normal vowel-weakening or under the influence of **dekm̥*[61]. As will be seen, it is not necessary to assume, as is done by Kent, that this **newm̥* "in rapid counting before **dekm̥*" became **newn̥*.

5. IE "eighth".

It is not easy to determine the original IE form of the ordinal "eighth". It is clear that it is a thematized derivative of the cardinal, but the latter cannot be reconstructed with certainty. It is customary to posit **oktō* and **oktōu*, variants reflecting an IE dual formation. But even if this interpretation is correct, it is by no means certain that Indo-European did have an original *-ōu*, and its sandhi-variant *-ō*, as the endings of the dual. It is just as possible that the original form of the dual nom-acc. ended in *-ou* which, as happens in many languages, was monophthongized to *-ō*, and the latter changed *-ou*, surviving under certain circumstances, to *-ōu*.

This point cannot be pursued in the present context but I hope to

[59] This was Meillet's view, MSL 17, 1912, 289.

[60] See, e. g., Kent, Donum natalicium Schrijnen, 1929, 346; Pokorny, IEW 319; Burrow, Sanskrit 259. Pisani's derivation from **neu-* "nod" (Rendiconti Accad. Lincei 6/8, 1932, 166) and Carnoy's **ne-w(e)n* "doigt qui ne peut travailler, ni atteindre" (Muséon 59, 1946, 568) cannot be taken seriously.

[61] If the original form was **newo* (see Ch. VI fn. 19), then the whole ending of **newm̥* can be due to **dekm̥*.

discuss it in detail elsewhere. It would seem, however, that the existence of an original **oktou* accounts most readily for the ordinal **oktŏwo-*, or **oktuwo-*, which has been postulated by many scholars. A form **oktŏwo-* can easily become **oktōwo-* under the influence of **oktō* — as happened in Latin. Greek, on the other hand, probably preserves the original **oktŏwo-* since its vocalism is required to account for ὄγδοϝος and the peculiar reshaping of ἕβδομος. Furthermore, Aryan would hardly have changed an inherited **aštāwa-*, while an **aštawa-* was an easy prey to the neighbouring *saptama-* and, perhaps, inherited *navama-*. The same applies to Balto-Slavic where **aśtōwa-* would likewise have resisted a change to **aśtmas*.

The point is of some importance for the cardinal "80" also. The original **oktou-dkont* became **oktō(d)kont-*, a form continued in Lat. *octōgintā*. Goth. *ahtautehund* hardly reflects *-ōu-*. It is more likely that **ahtōhund* was refashioned after *ahtau*. The OHG *ahtozo* etc. certainly demand **oktō-*, not **oktōu-*.

Baltic **aś(t)mas* represents a Balto-Slav transformation of IE **oktŏwo-* (or *-uwo-*) and Lithu. *aštuñtas* is a still later innovation of Eastern Baltic. But the latter only became necessary and possible when for the cardinal the form **aštōn* had been innovated. There was no time at which an **aštŭta-* could be regarded as "inherited", an erroneous view surprisingly frequently repeated[62]. In fact such a form never existed. Its only "raison d'être" is Goth. *ahtuda-*, interpreted as *ahtŭda-* but on that see p. 89 with fn. 100.

[62] Cp. Trautmann, Baltisch-Slavisches Wb. 15; Meillet, BSL 29, 32; Fränkel, Litauisches Etym. Wb. 19 f.; Rosenfeld, Zahlen 185 A.

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9. *Iranian*

Abbreviations:
Af. = Afghan, Av. = Avestan, Bal. = Balūčī, Chw. = Chwārezmī, Kh. = Khotanese, MI. = Middle Iranian, MP. = Middle Persian, NP. = New Persian, O. = Ossete, (O) D. = Digor, (O) I. = Iron, Orm. = Ormurī, OP. = Old Persian, Par. = Parāčī, Phl. = Pahlavī, Prt. = Parthian, S. = Sogdian, CS. = Christian Sogdian, BS. = Buddhist Sogdian

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